

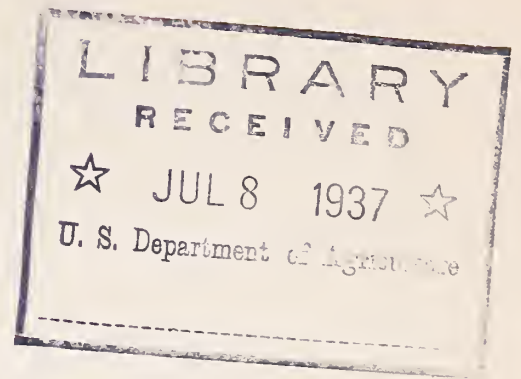
## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



1.9  
66752 Rpa

UNITED STATES DEPARTMENT OF AGRICULTURE  
Bureau of Agricultural Economics



Charts

Relation of Pastures, Feed Production, and  
Butterfat Price Ratios to Dairy Production

*By [illegible]  
[illegible]  
May 1937*

-----

Prepared by

E. E. VIAL

Washington, D. C.  
May 1937

1914

1914

1914

1914

1914

FIGURE 1. - RELATIONSHIP OF PASTURE CONDITIONS TO DAIRY PRODUCTION, 1874-1914

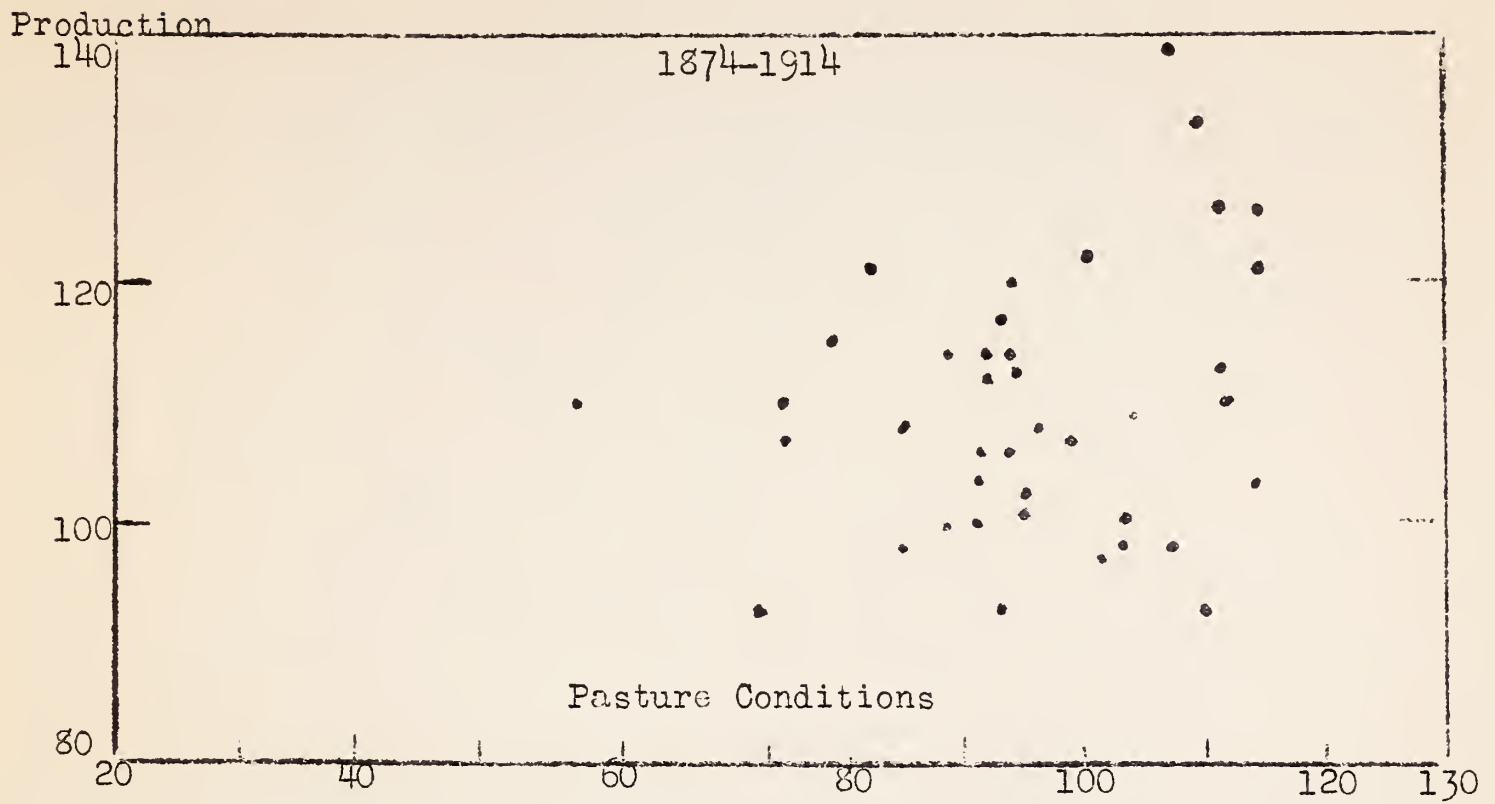
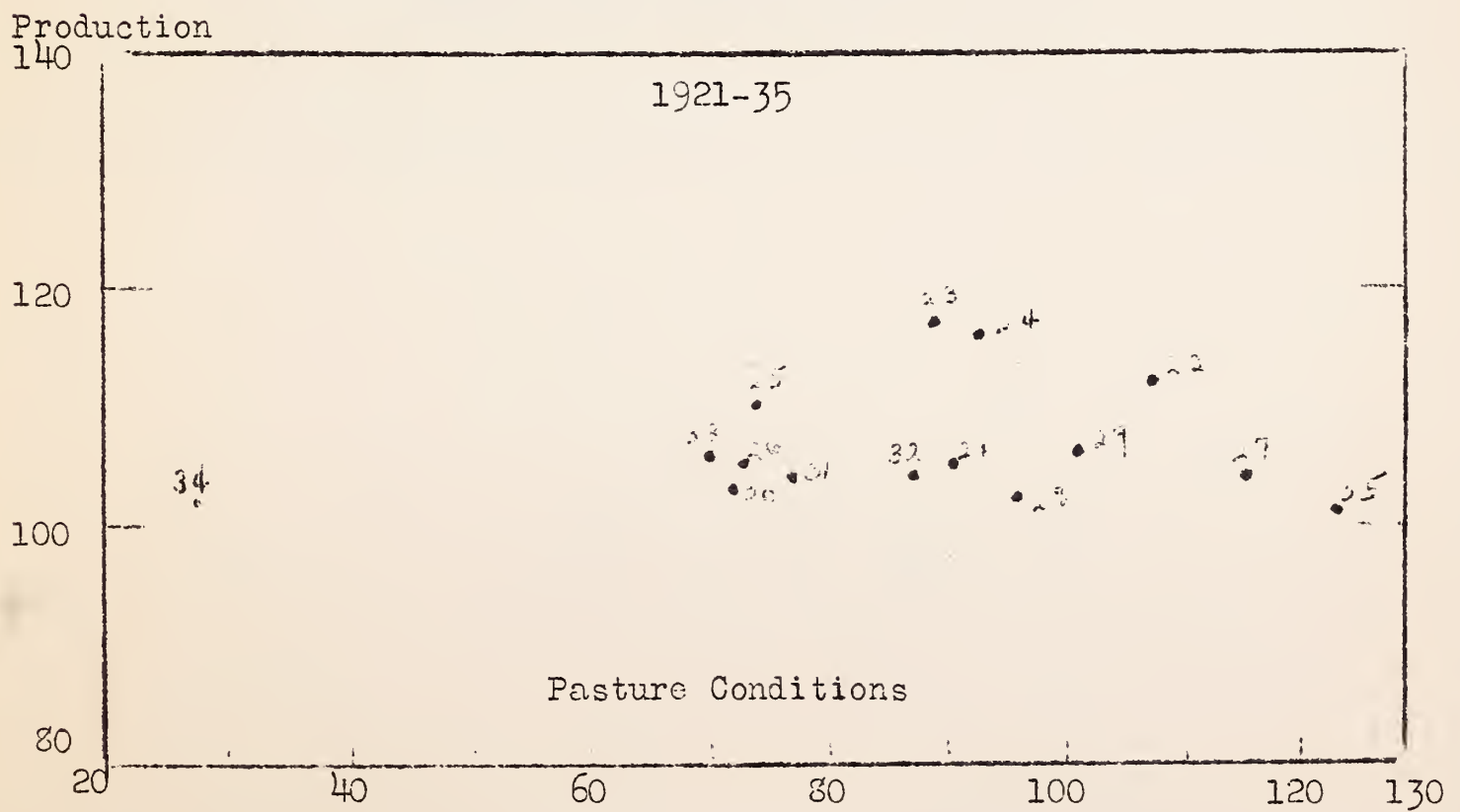


FIGURE 2. - RELATIONSHIP OF PASTURE CONDITIONS TO DAIRY PRODUCTION, 1921-1935



[illegible]

1.  $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

FIGURE 3. - RELATIONSHIP BETWEEN THE BUTTERFAT FEED PRICE RATIO AND DAIRY PRODUCTION, THE SAME YEAR, 1874-1914

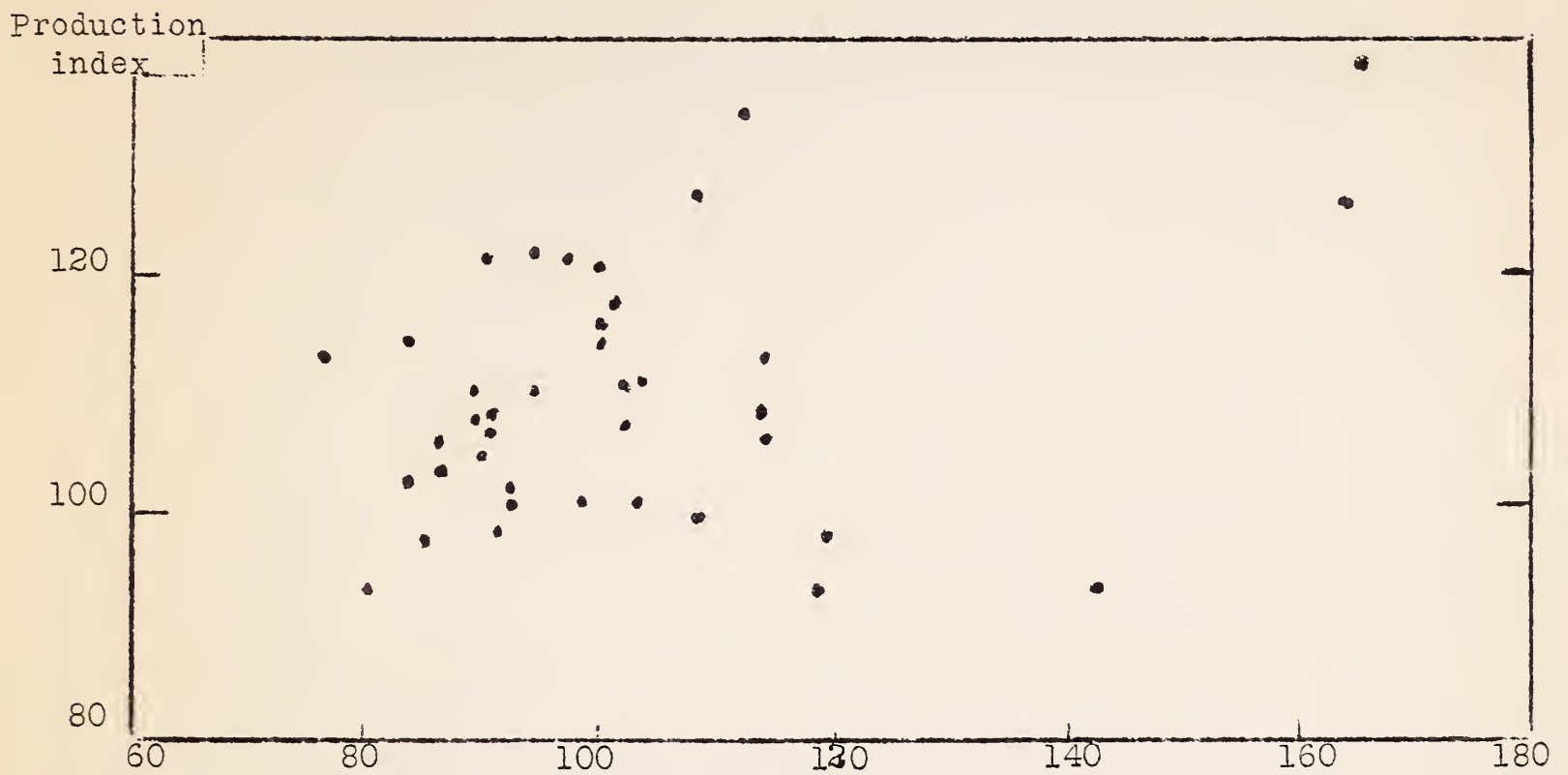


FIGURE 4. - RELATIONSHIP BETWEEN THE BUTTERFAT FEED PRICE RATIO AND DAIRY PRODUCTION, THE SAME YEAR, 1921-35

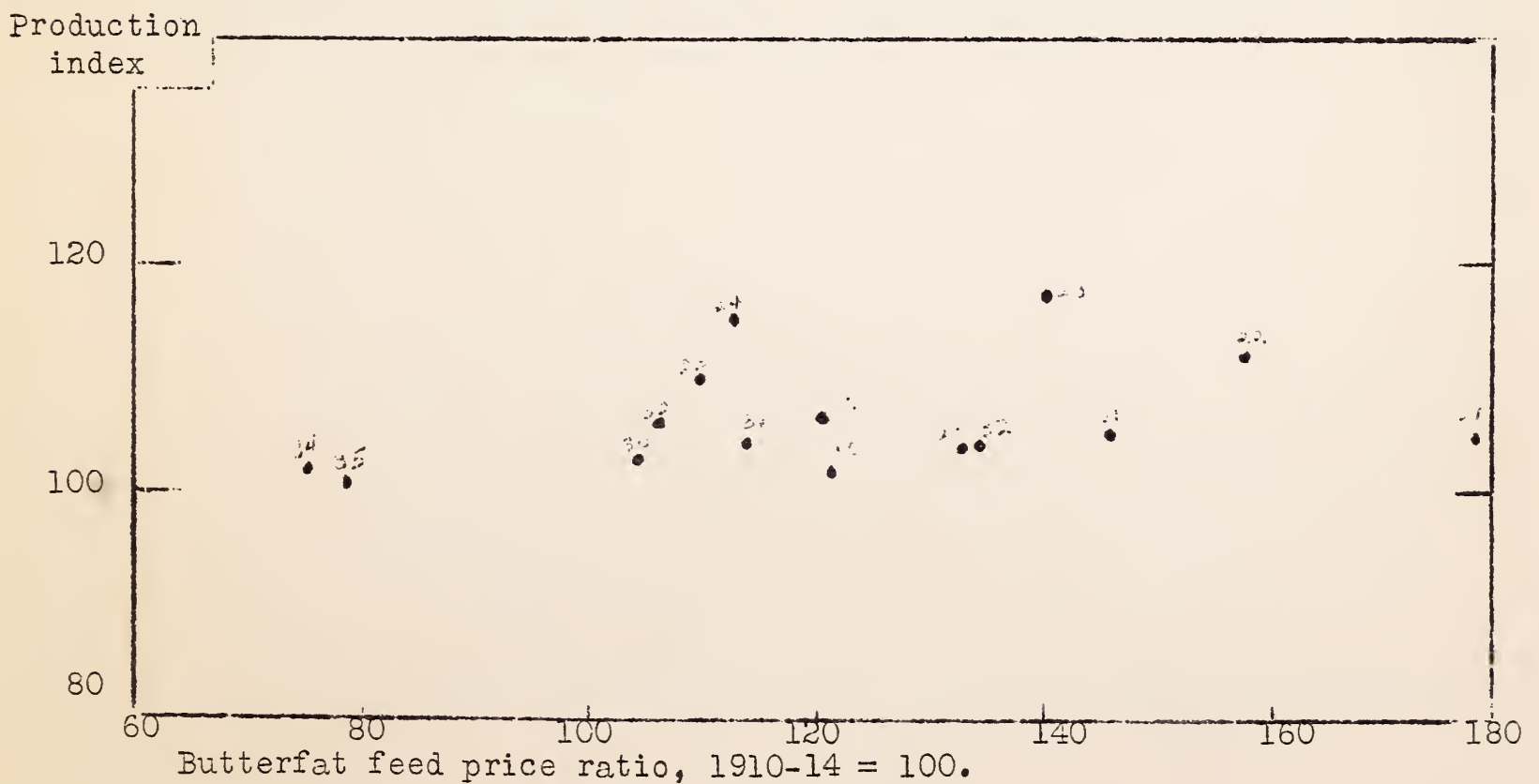






FIGURE 5. - RELATIONSHIP BETWEEN THE BUTTERFAT FEED PRICE RATIO AND DAIRY PRODUCTION THE FOLLOWING YEAR, 1874-1914

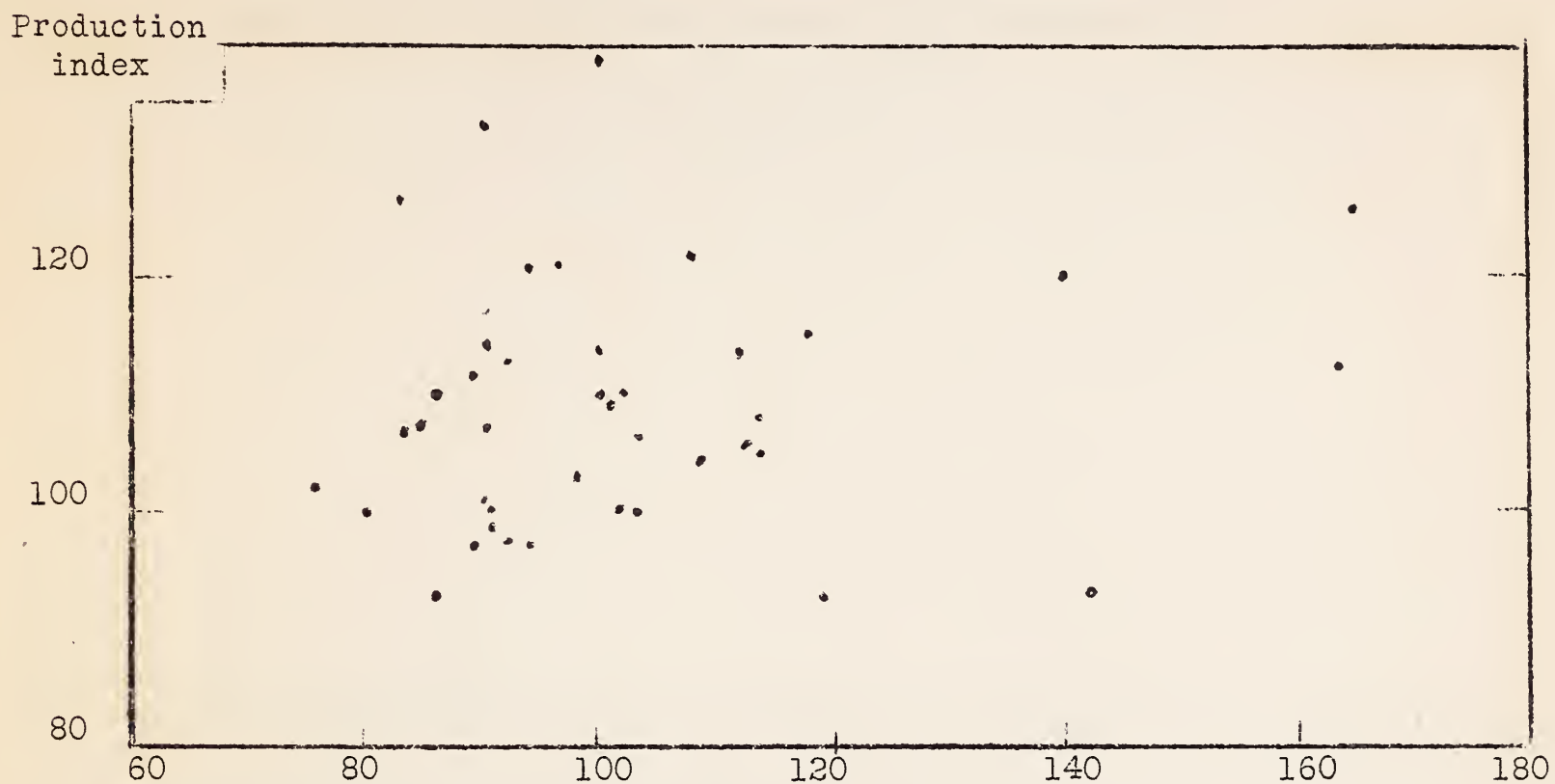


FIGURE 6. - RELATIONSHIP BETWEEN THE BUTTERFAT FEED PRICE RATIO AND DAIRY PRODUCTION THE FOLLOWING YEAR, 1921-35

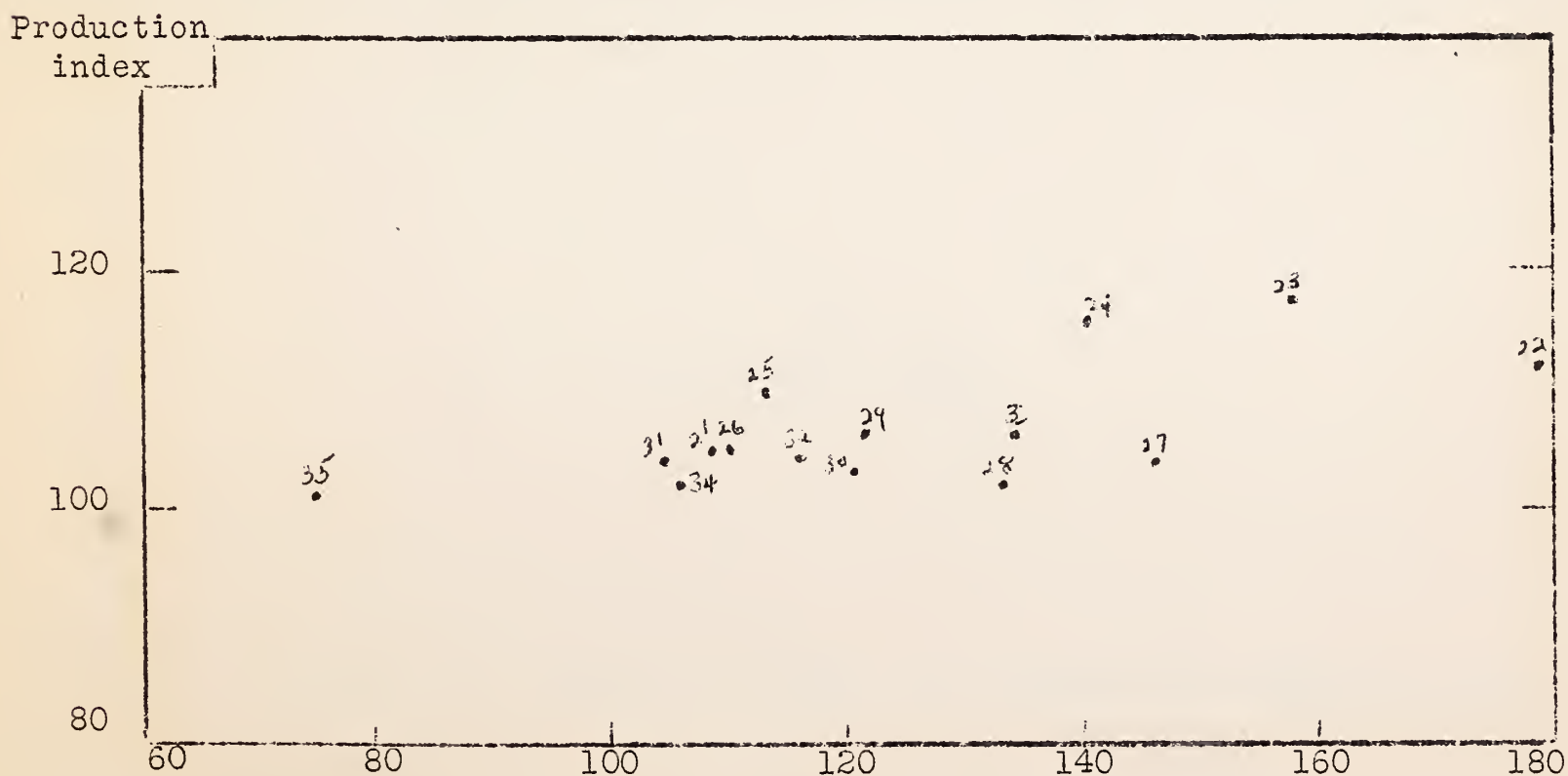




FIGURE 7. - RELATIONSHIP BETWEEN THE BUTTERFAT FEED PRICE RATIO, 3-YEAR AVERAGE, AND DAIRY PRODUCTION, 1874-1914

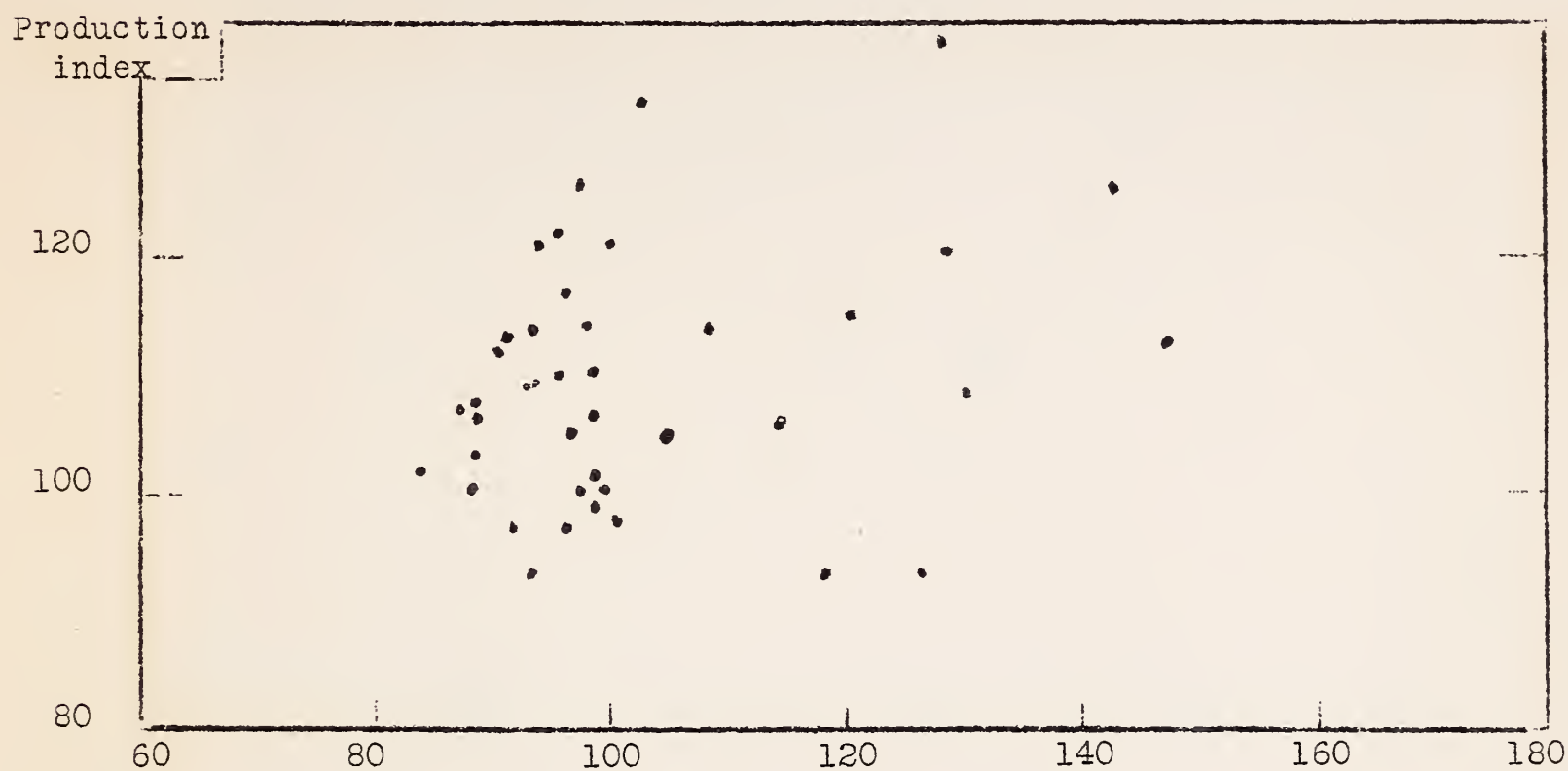


FIGURE 8. - RELATIONSHIP BETWEEN THE BUTTERFAT FEED PRICE RATIO, 3-YEAR AVERAGE, AND DAIRY PRODUCTION, 1921-35

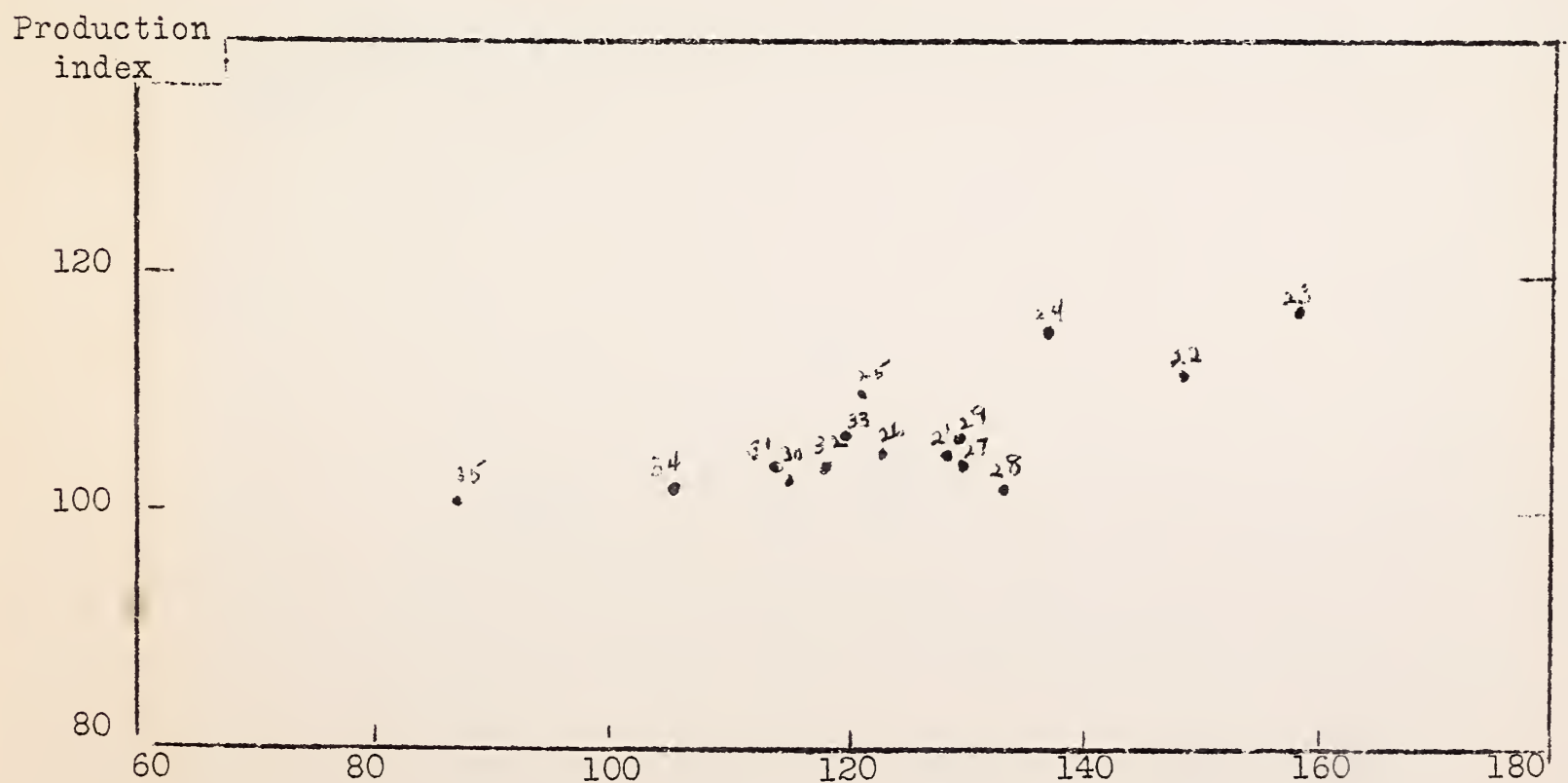




FIGURE 9. - RELATIONSHIP BETWEEN FEED GRAINS FED AND DAIRY PRODUCTION,  
THE SAME YEAR, 1874-1914

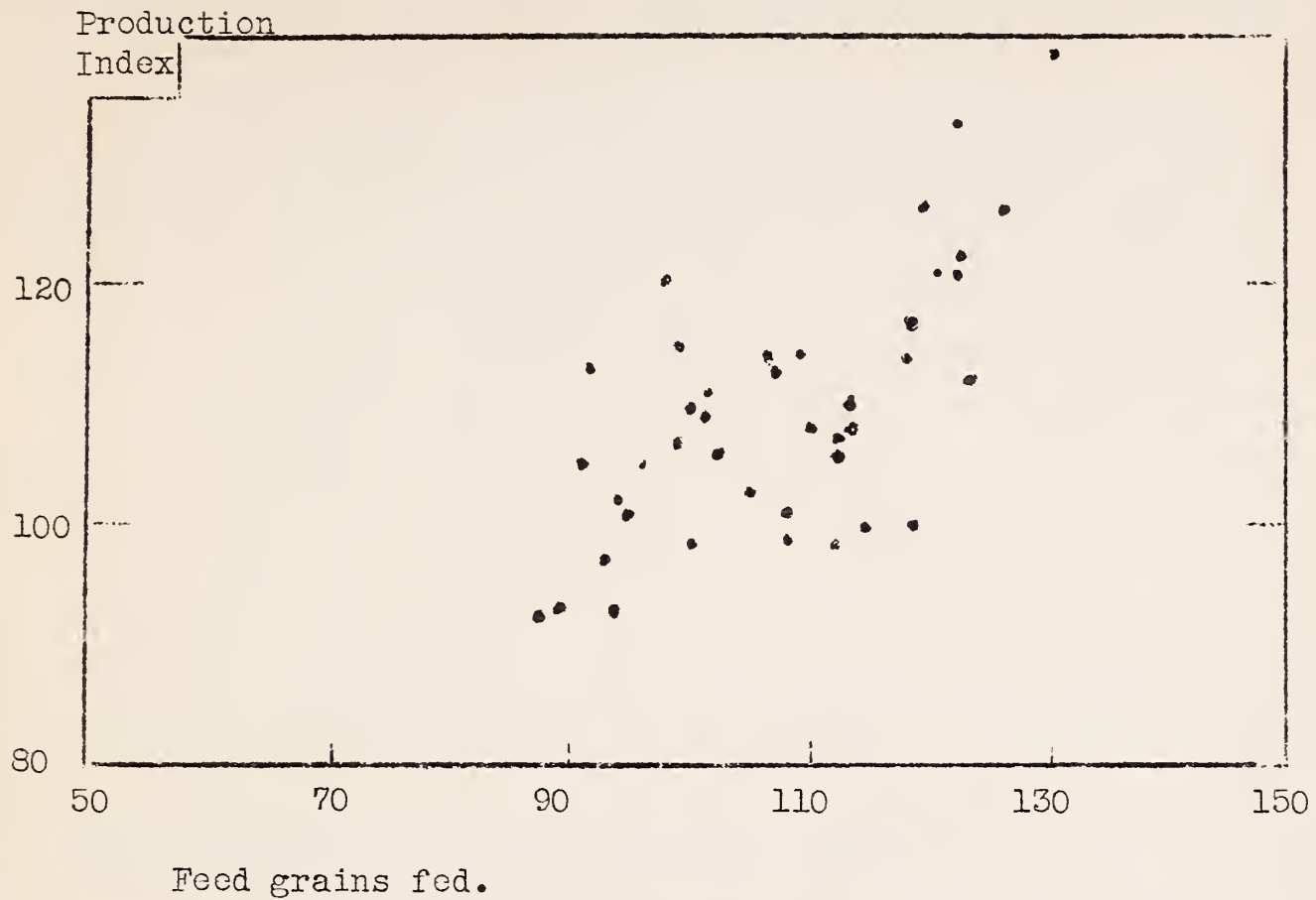


FIGURE 10. - RELATIONSHIP BETWEEN FEED GRAINS FED AND DAIRY PRODUCTION,  
THE SAME YEAR, 1921-35

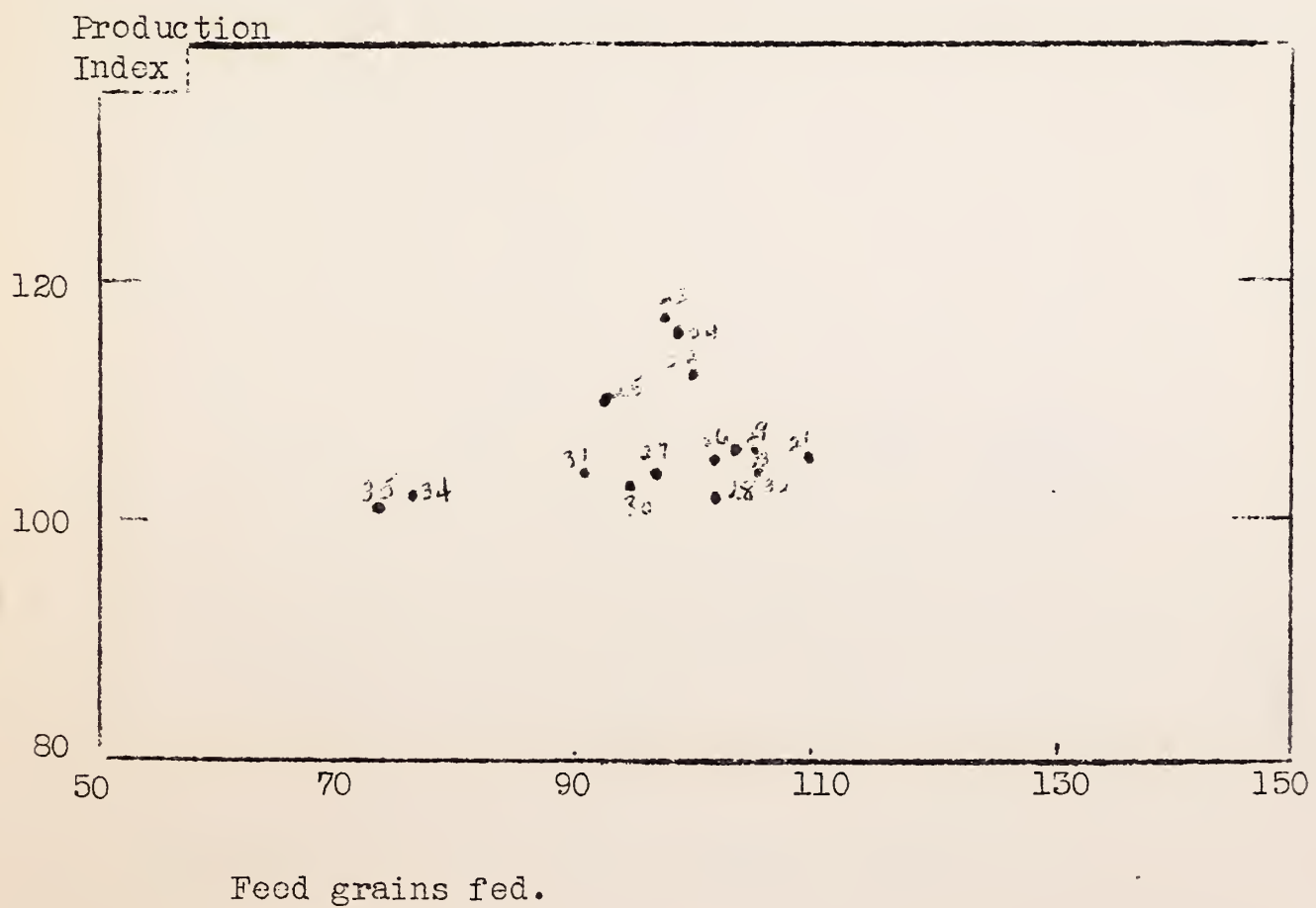




FIGURE 11. - RELATIONSHIP BETWEEN BUTTERFAT HOG PRICE RATIO AND DAIRY PRODUCTION, THE SAME YEAR, 1874-1914

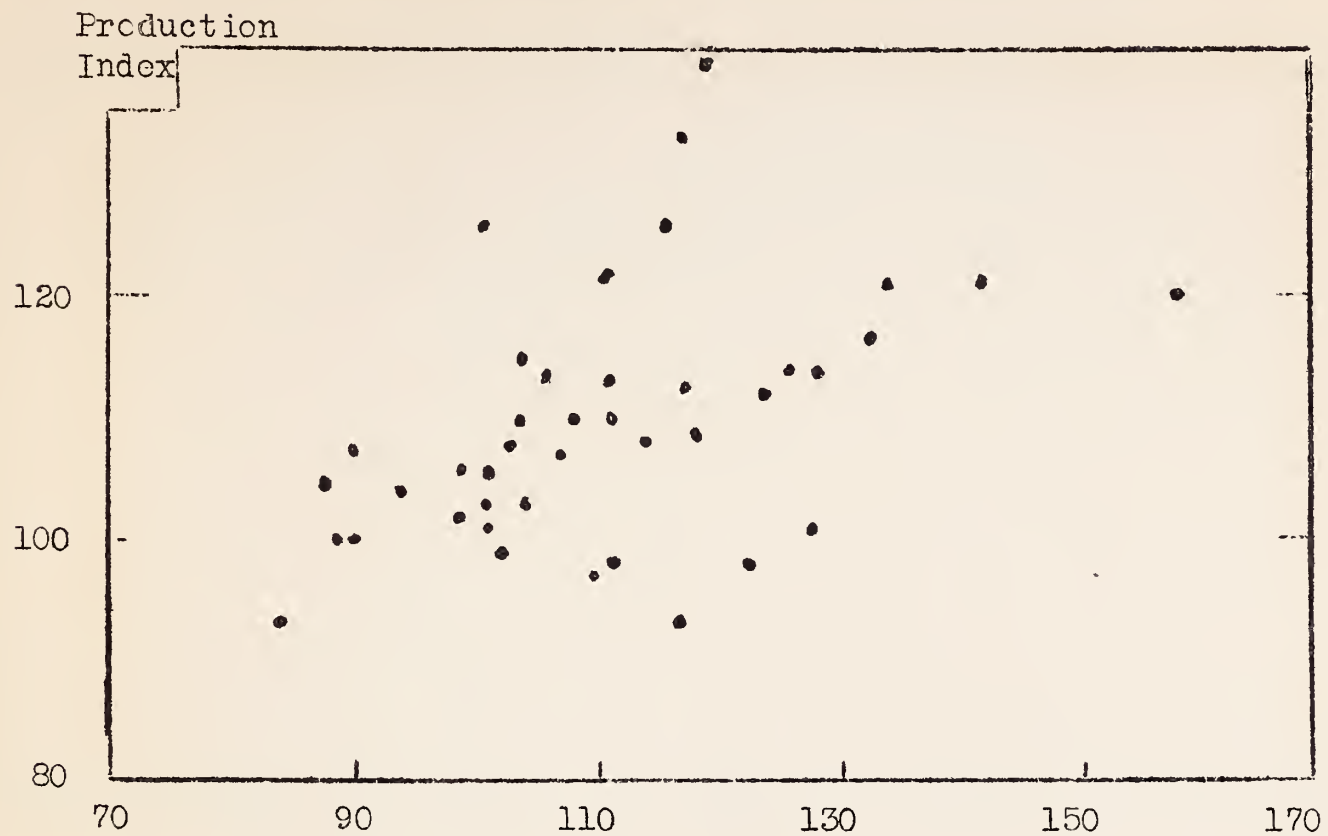


FIGURE 12. - RELATIONSHIP BETWEEN BUTTERFAT HOG PRICE RATIO AND DAIRY PRODUCTION, THE SAME YEAR, 1921-35

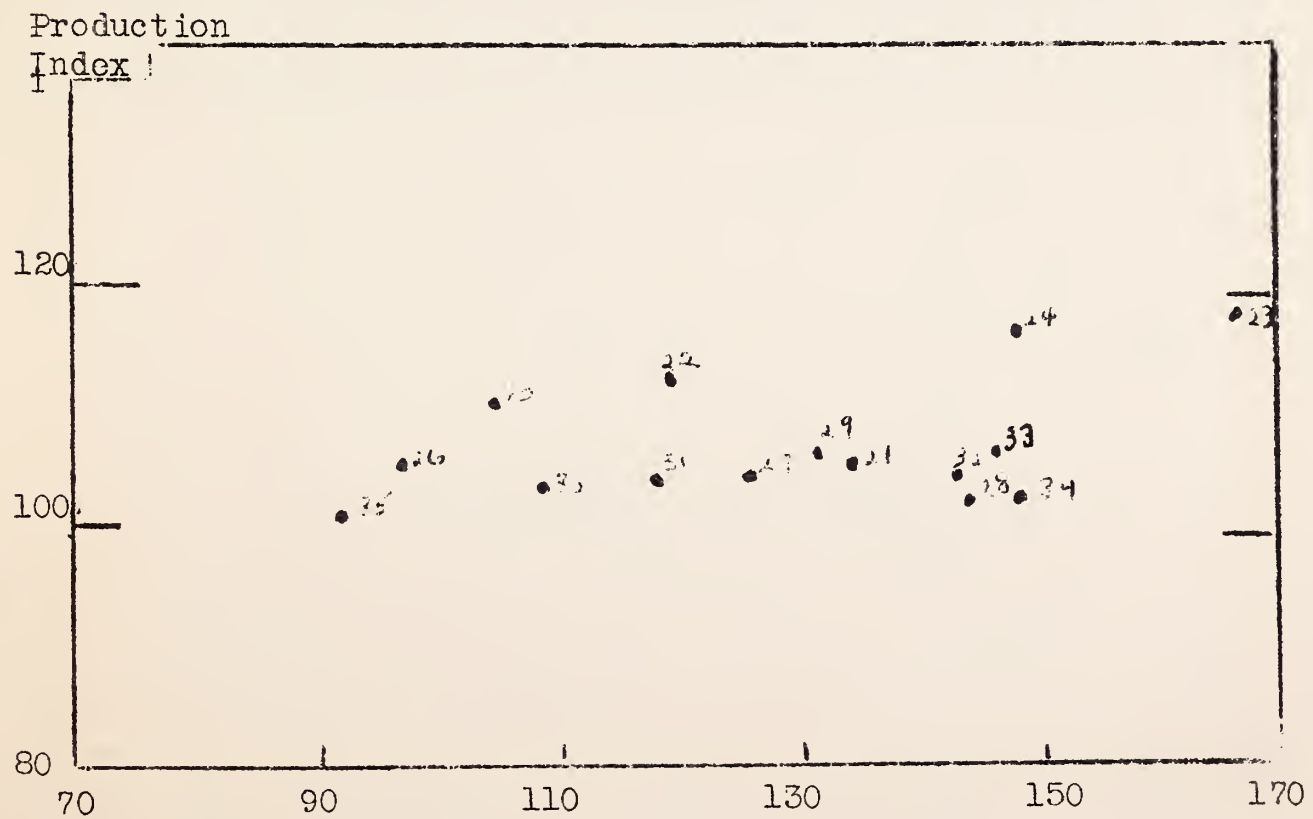






FIGURE 13.- RELATIONSHIP BETWEEN BUTTERFAT HOG PRICE RATIO AND DAIRY PRODUCTION THE FOLLOWING YEAR, 1874-1914

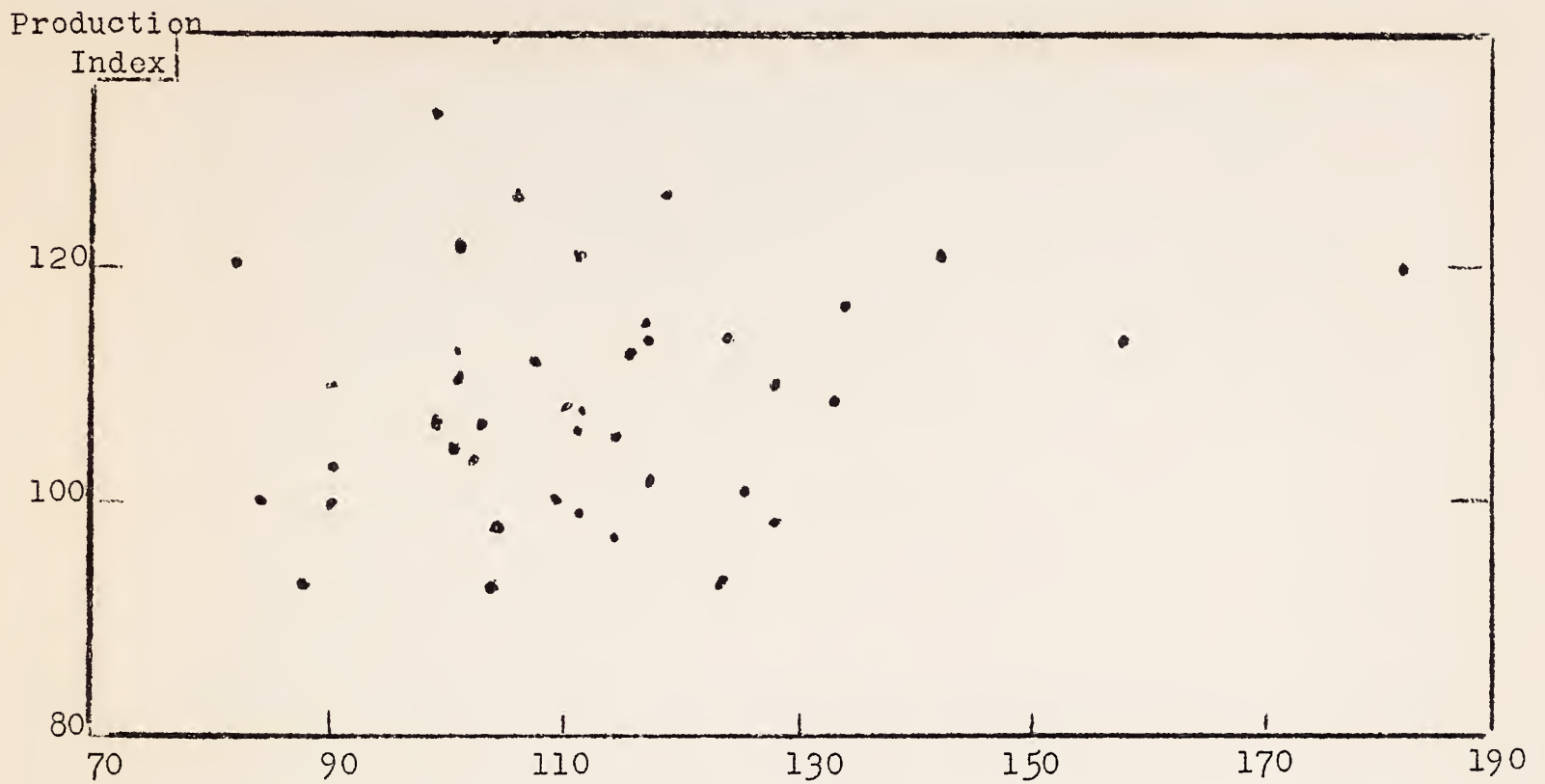


FIGURE 14.- RELATIONSHIP BETWEEN BUTTERFAT HOG PRICE RATIO AND DAIRY PRODUCTION THE FOLLOWING YEAR, 1921-35

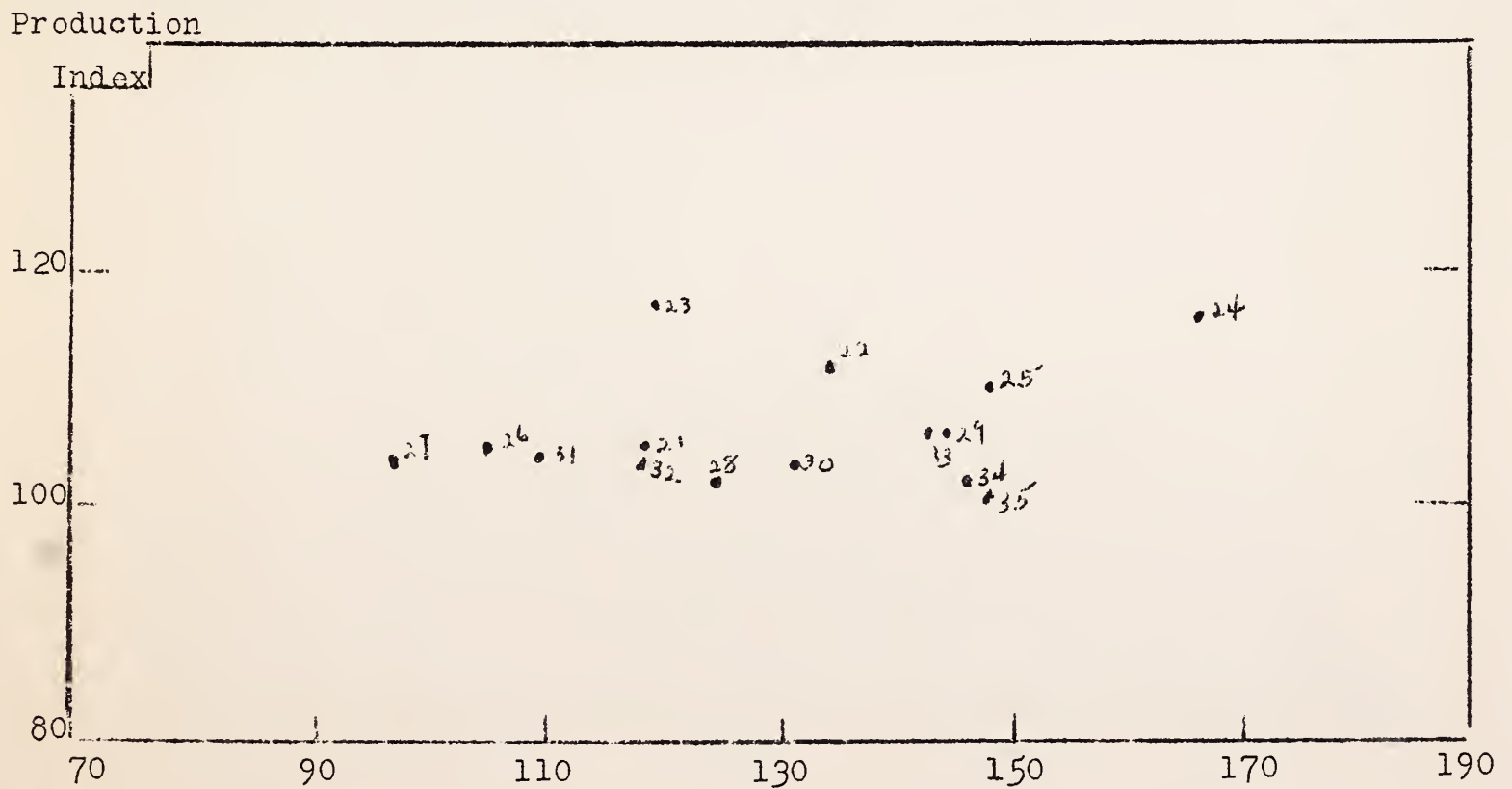




FIGURE 15.- RELATIONSHIP BETWEEN BUTTERFAT HOG PRICE RATIO  
(2-YEAR WEIGHTED AVERAGE) AND DAIRY PRODUCTION, 1874-1914

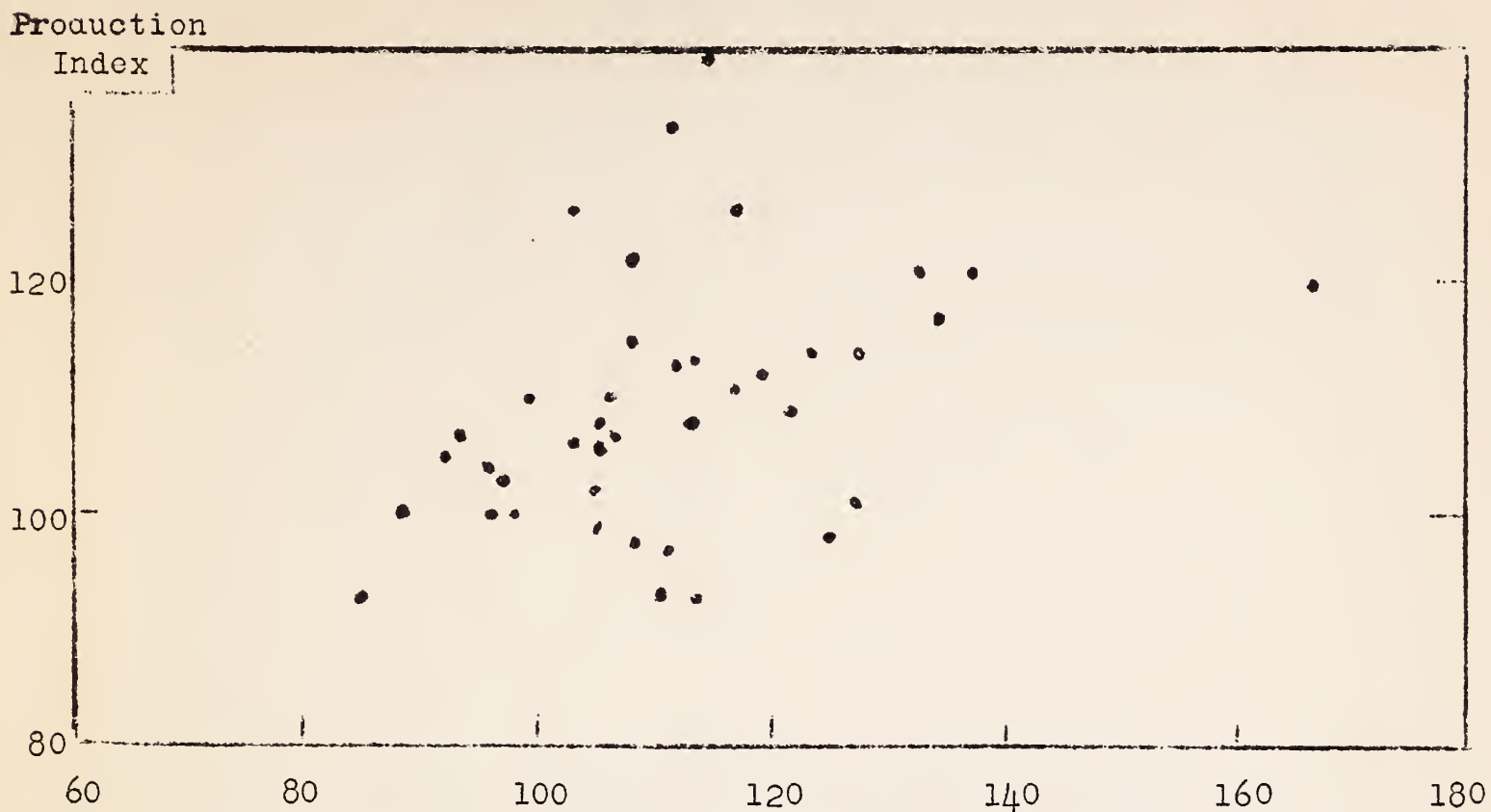


FIGURE 16.- RELATIONSHIP BETWEEN BUTTERFAT HOG PRICE RATIO  
(2-YEAR WEIGHTED AVERAGE) AND DAIRY PRODUCTION, 1921-35

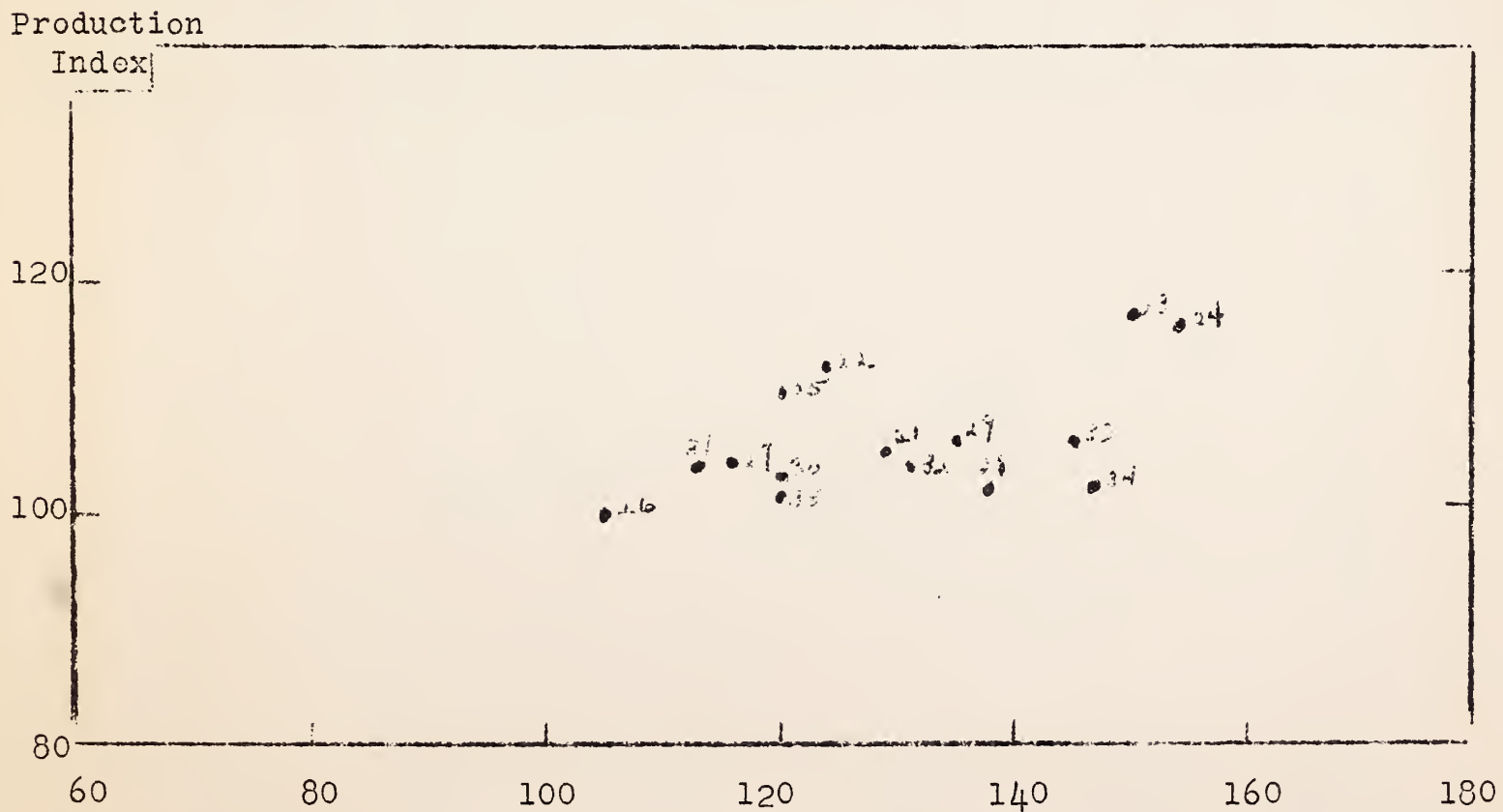




FIGURE 17. - RELATIONSHIP BETWEEN THE BUTTERFAT CATTLE PRICE RATIO AND DAIRY PRODUCTION THE SAME YEAR, 1874-1914

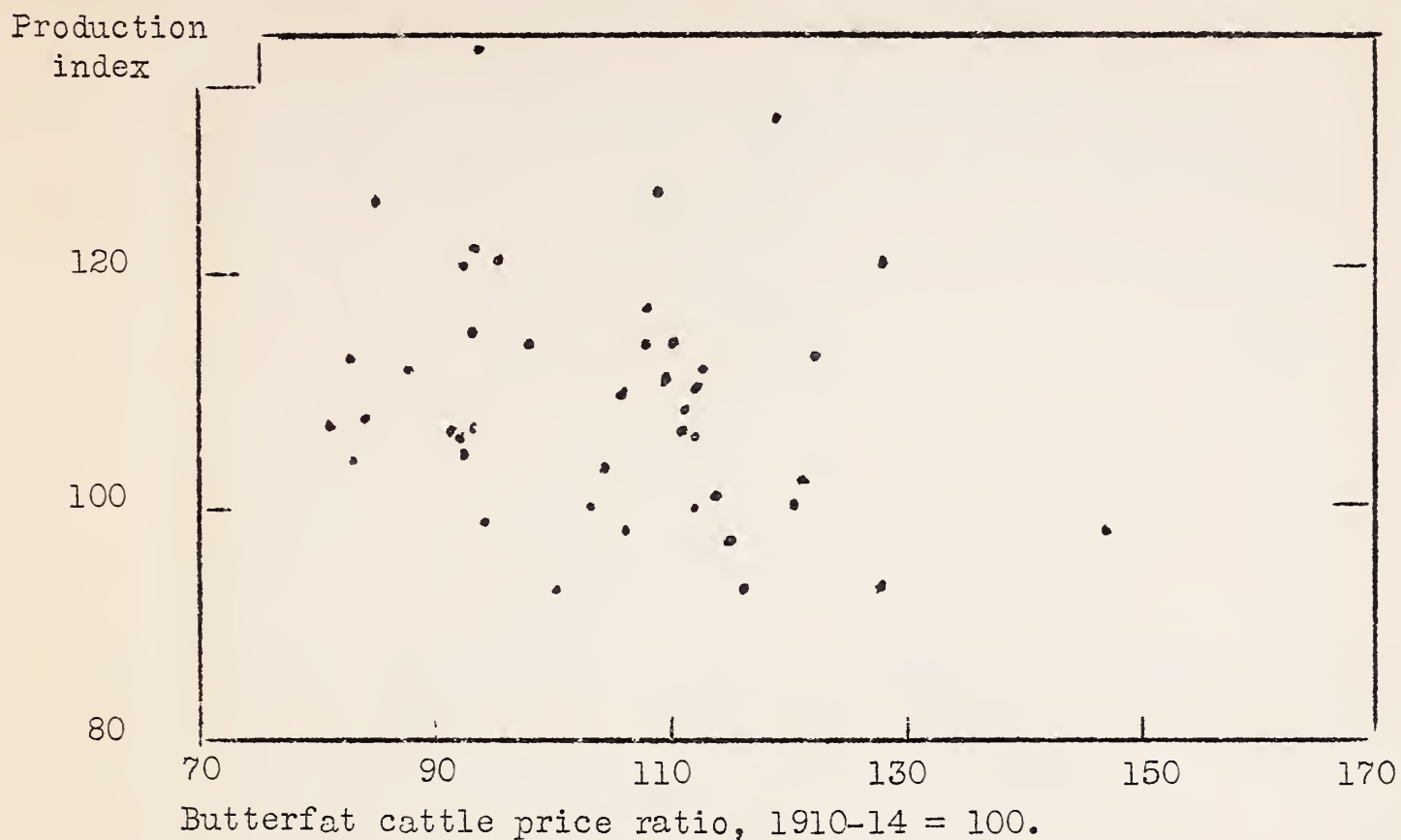
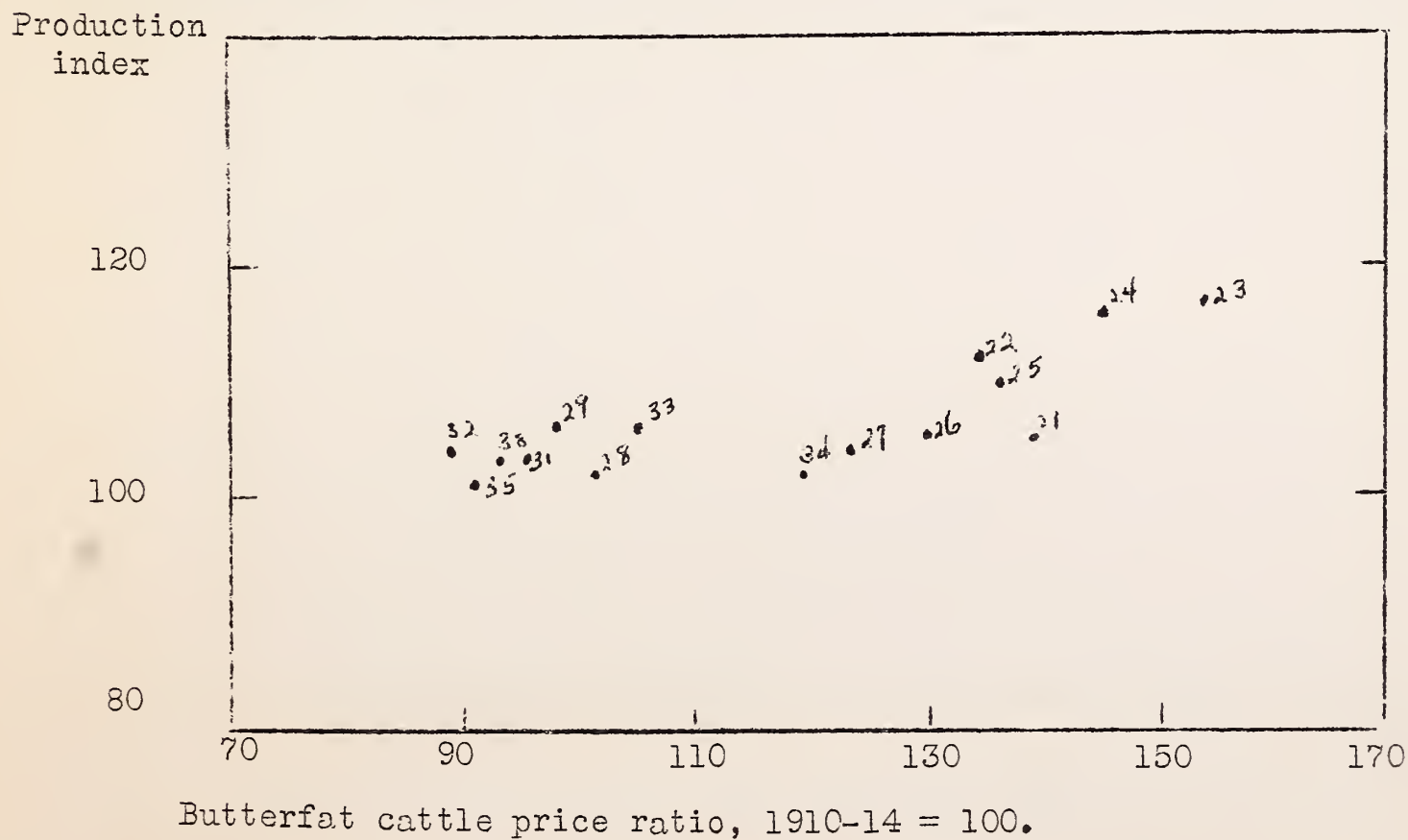


FIGURE 18.- RELATIONSHIP BETWEEN THE BUTTERFAT CATTLE PRICE RATIO AND DAIRY PRODUCTION THE SAME YEAR, 1921-35



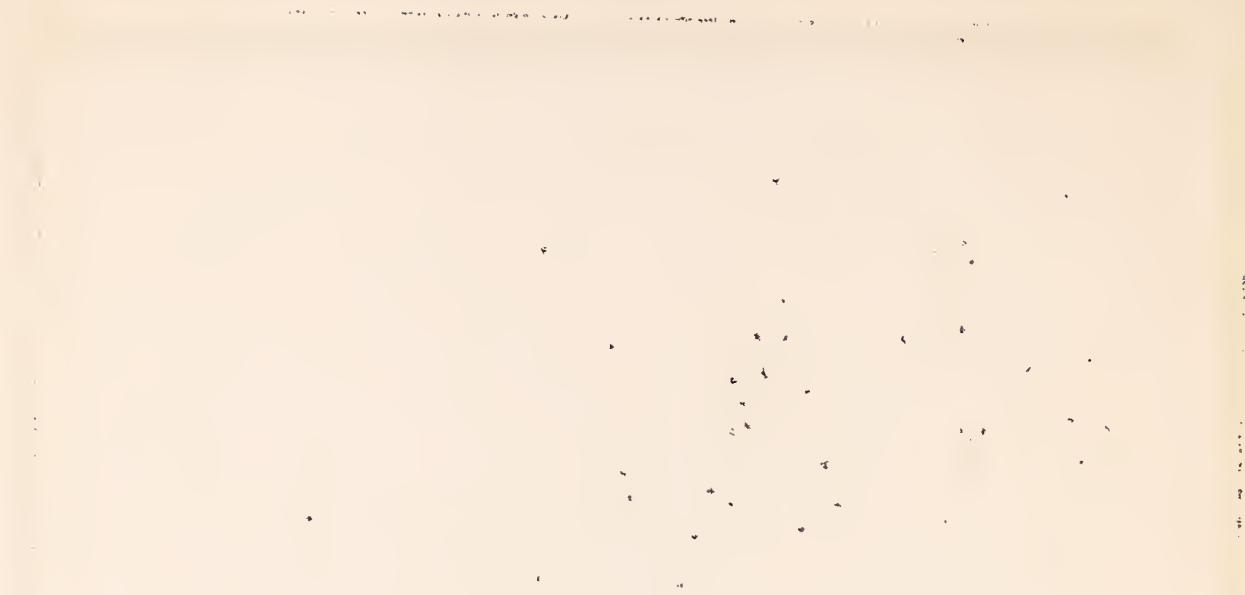


Figure 1: Scatter Plot of X and Y

The data points are clustered in the center of the plot, with a few outliers.

The data points are clustered in the center of the plot, with a few outliers.

The data points are clustered in the center of the plot, with a few outliers.

The data points are clustered in the center of the plot, with a few outliers.

The data points are clustered in the center of the plot, with a few outliers.

The data points are clustered in the center of the plot, with a few outliers.

FIGURE 10.- RELATIONSHIP BETWEEN THE BUTTERFAT CATTLE PRICE RATIO AND DAIRY PRODUCTION 3 YEARS LATER, 1874-1914

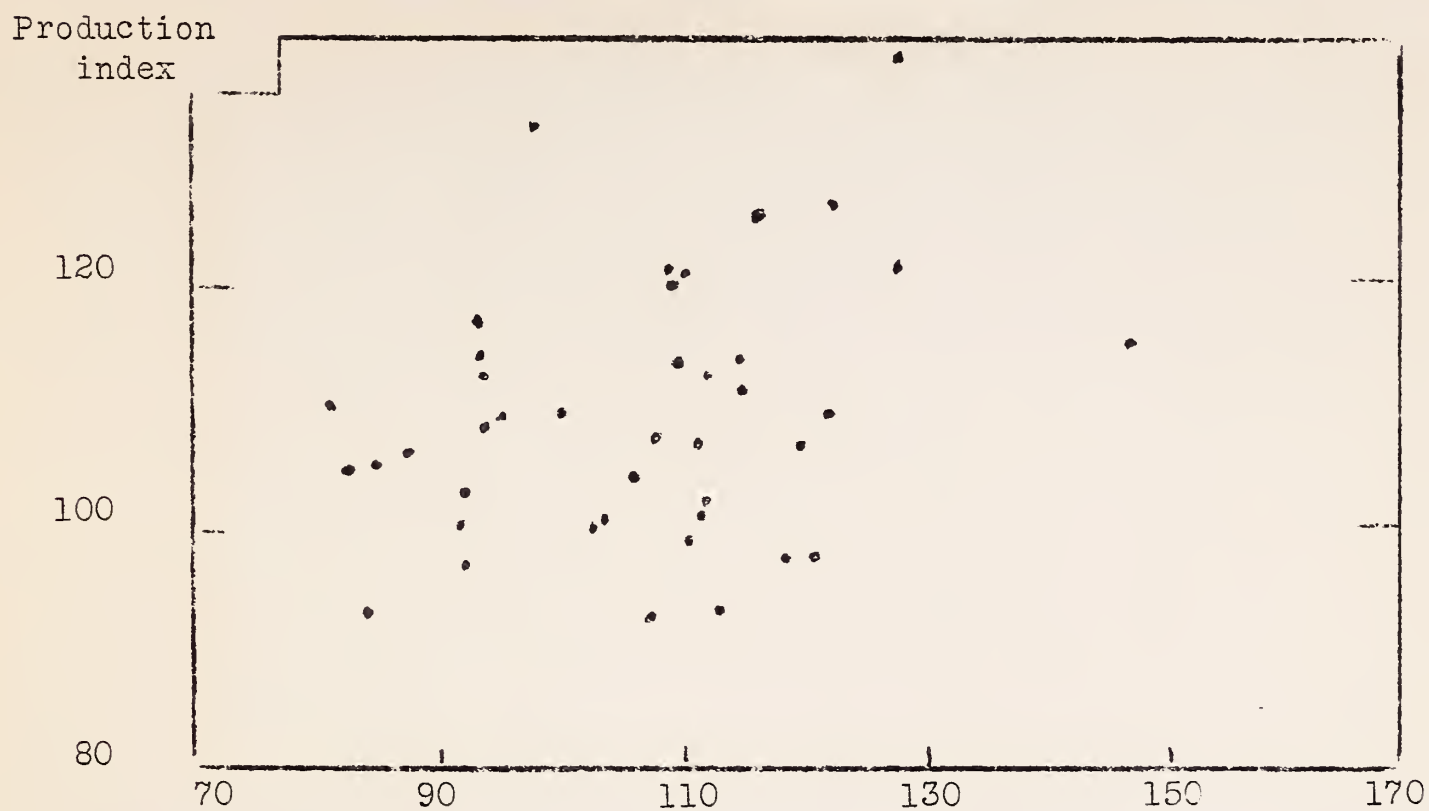
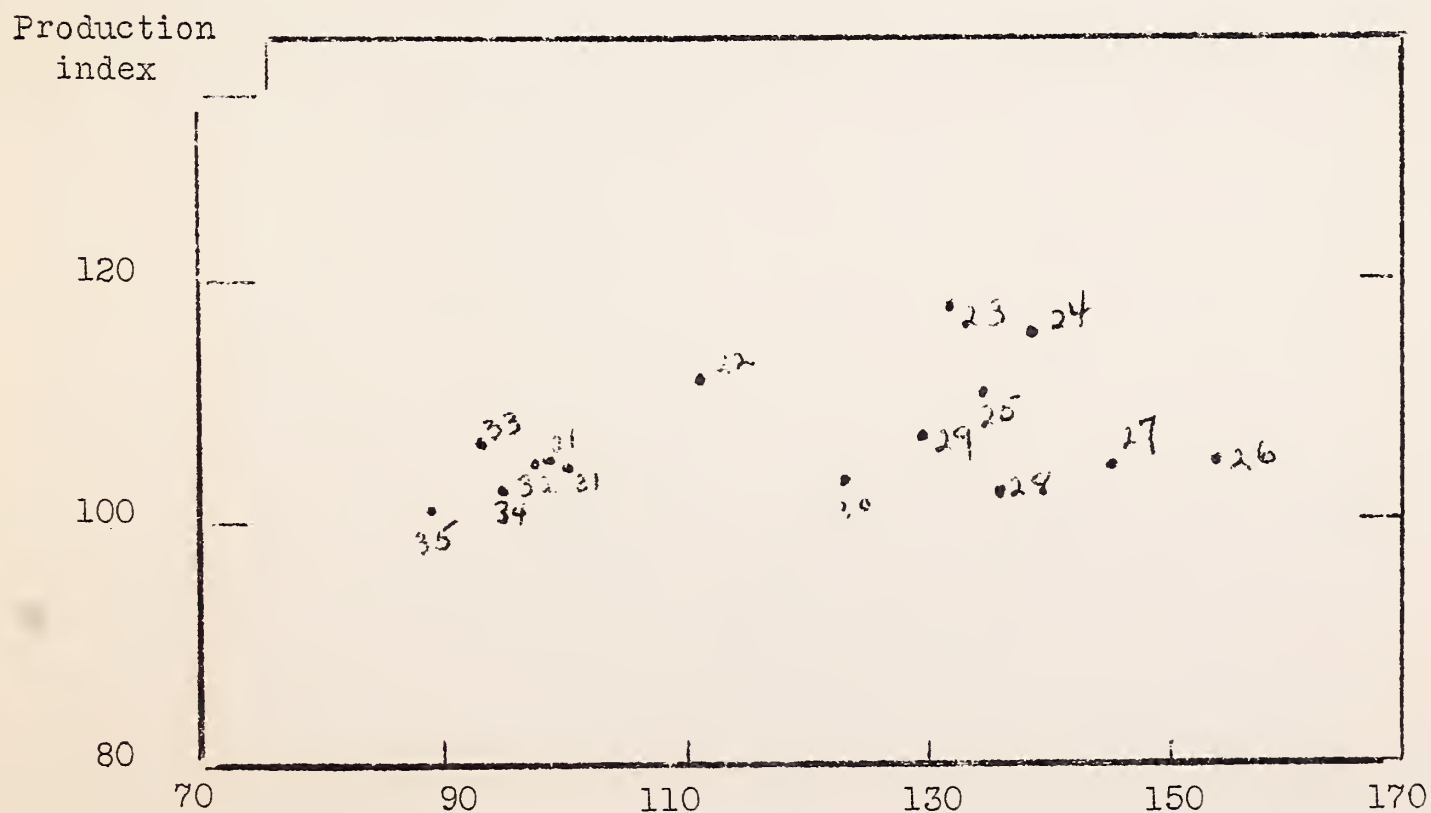


FIGURE 20.- RELATIONSHIP BETWEEN THE BUTTERFAT CATTLE PRICE RATIO AND DAIRY PRODUCTION, 3 YEARS LATER, 1921-35





THE UNIVERSITY OF CHICAGO  
LIBRARY

THE UNIVERSITY OF CHICAGO LIBRARY



THE UNIVERSITY OF CHICAGO LIBRARY

THE UNIVERSITY OF CHICAGO LIBRARY

THE UNIVERSITY OF CHICAGO LIBRARY



THE UNIVERSITY OF CHICAGO LIBRARY

THE UNIVERSITY OF CHICAGO LIBRARY



FIGURE 21. - RELATIONSHIP BETWEEN THE BUTTERFAT CATTLE PRICE RATIO AND DAIRY PRODUCTION 4 YEARS LATER, 1874-1914

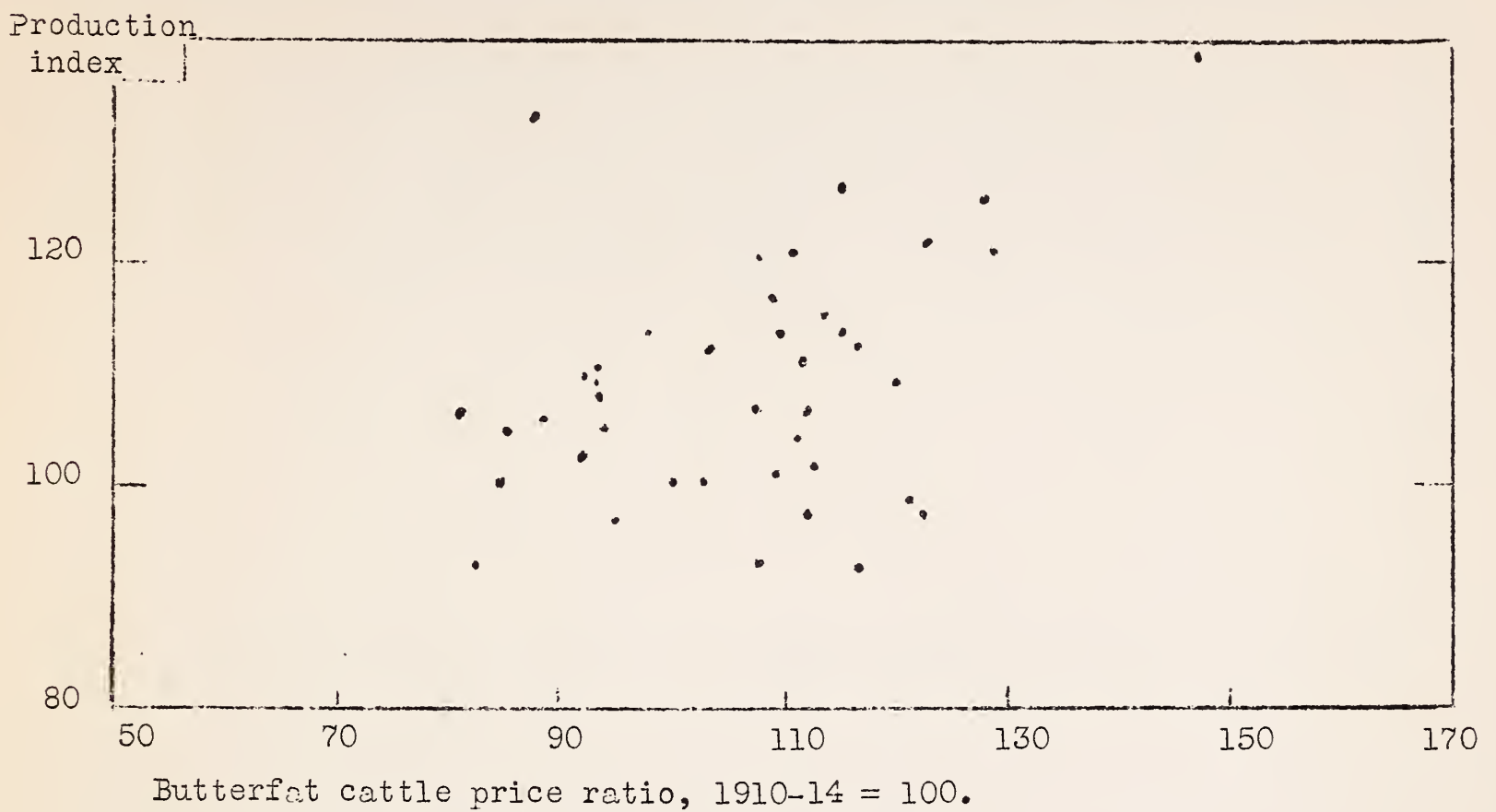


FIGURE 22. - RELATIONSHIP BETWEEN THE BUTTERFAT CATTLE PRICE RATIO AND DAIRY PRODUCTION 4 YEARS LATER, 1921-35

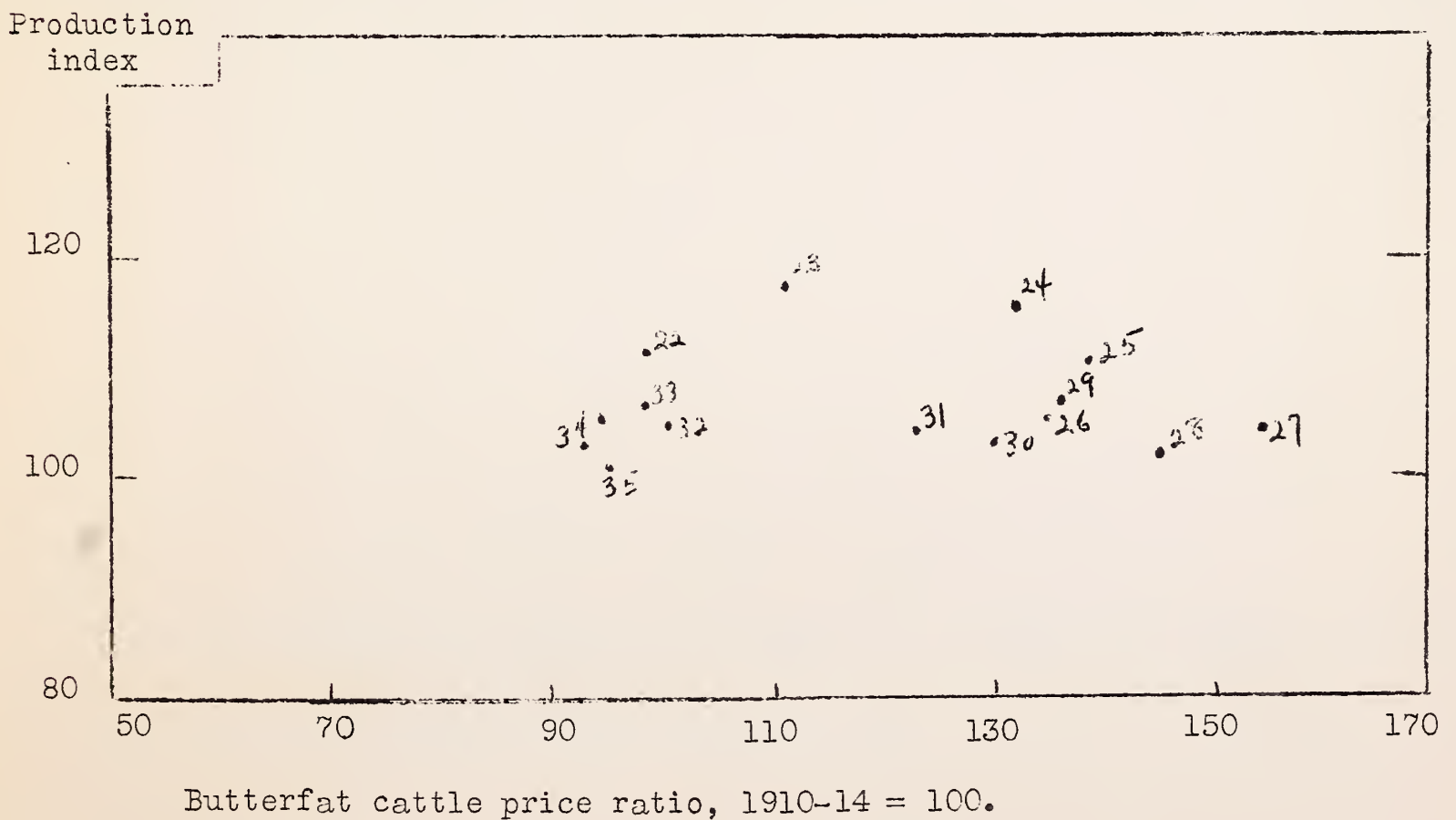




FIGURE 23.- RELATIONSHIP BETWEEN THE BUTTERFAT CATTLE PRICE RATIO AND DAIRY PRODUCTION 5 YEARS LATER, 1874-1914

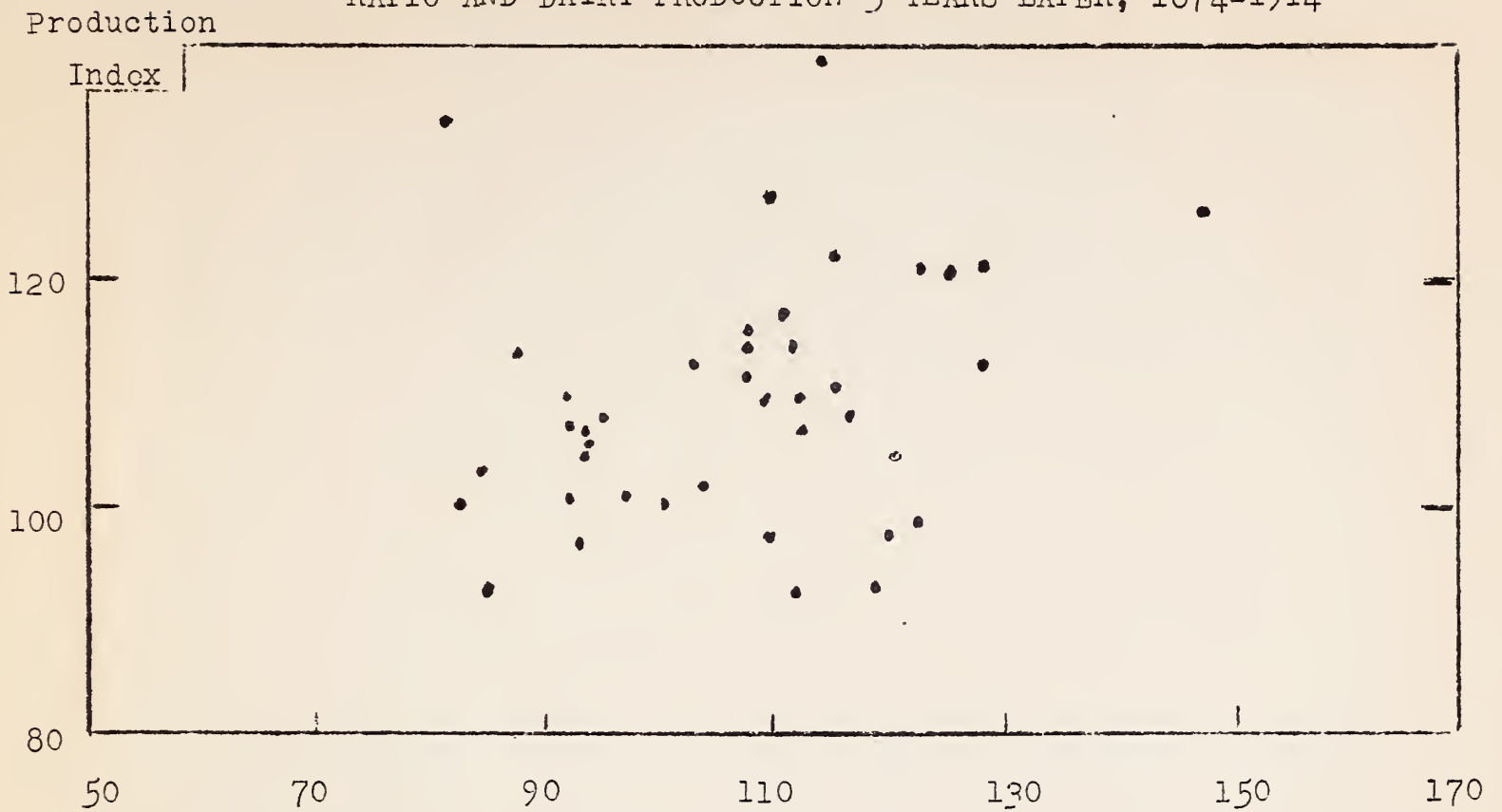
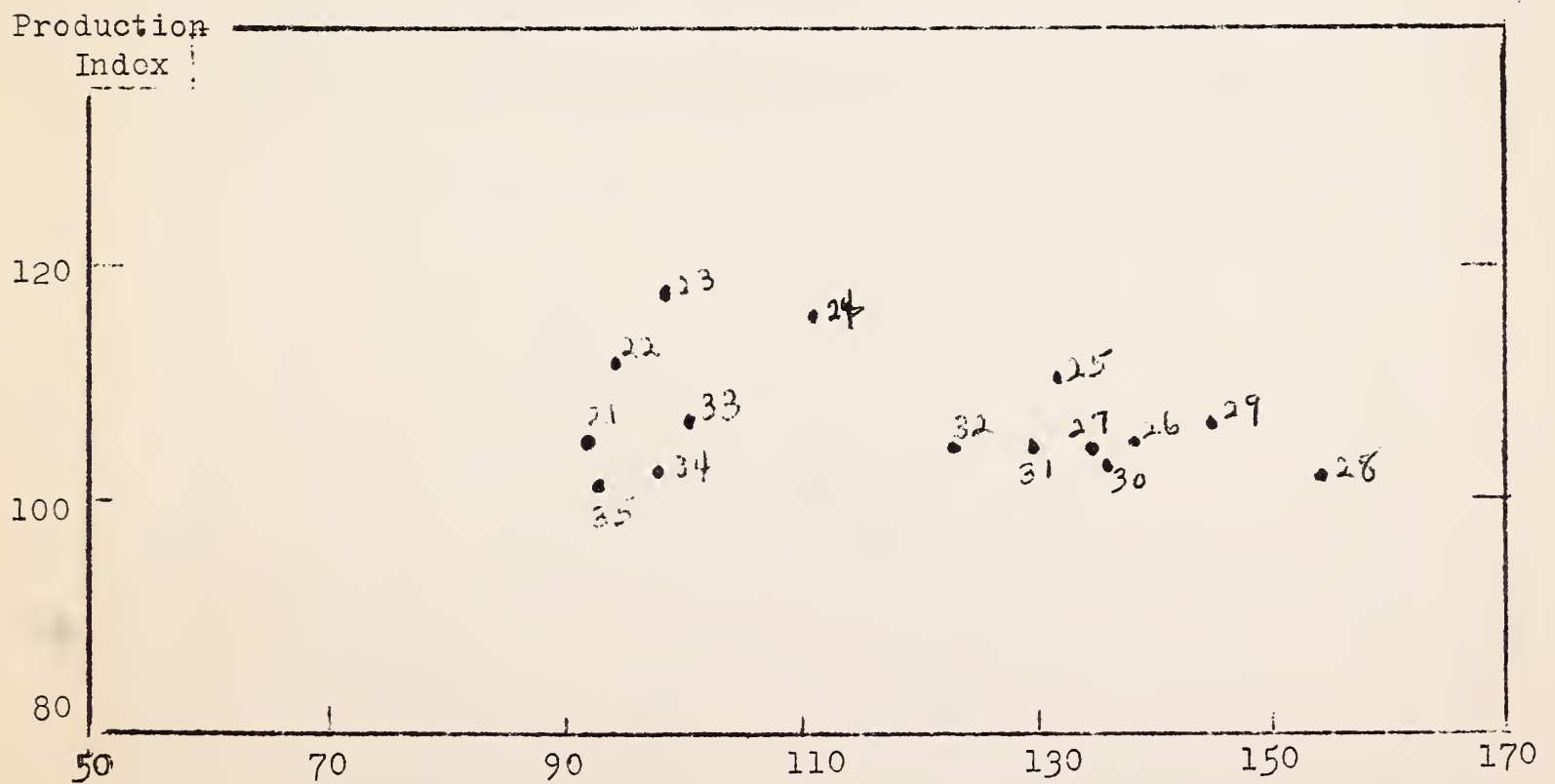


FIGURE 24.- RELATIONSHIP BETWEEN THE BUTTERFAT CATTLE PRICE RATIO AND DAIRY PRODUCTION 5 YEARS LATER, 1921-35



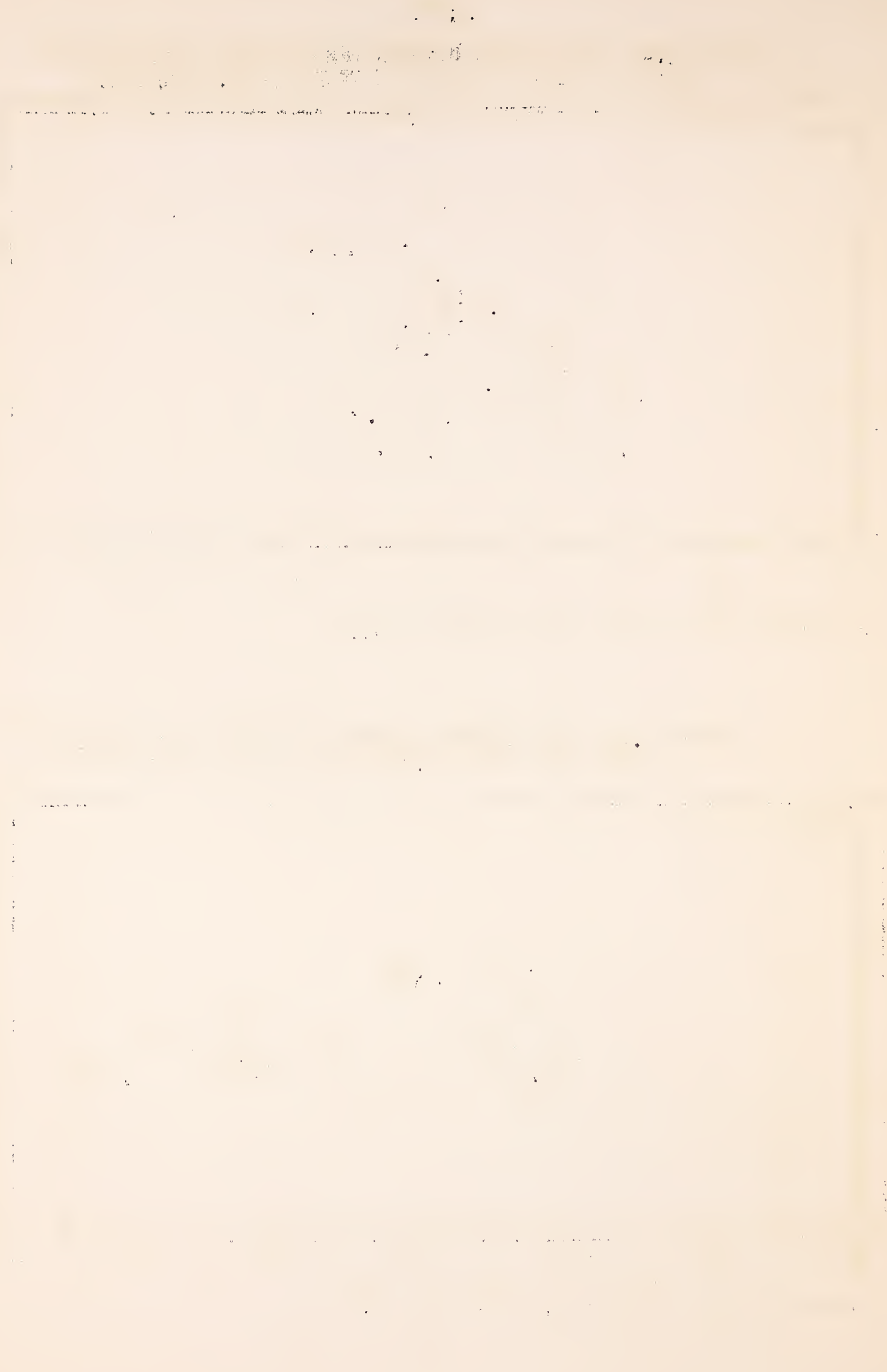
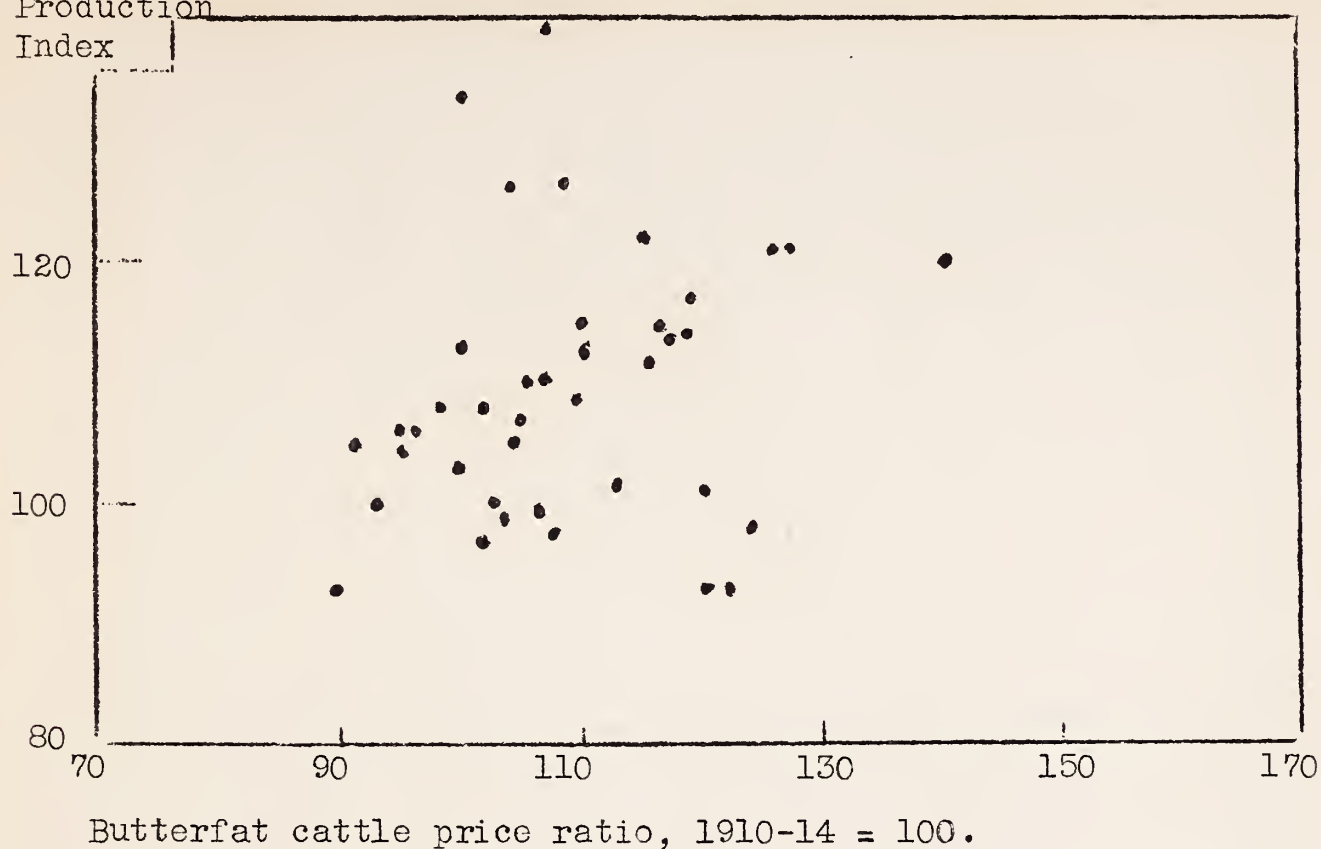
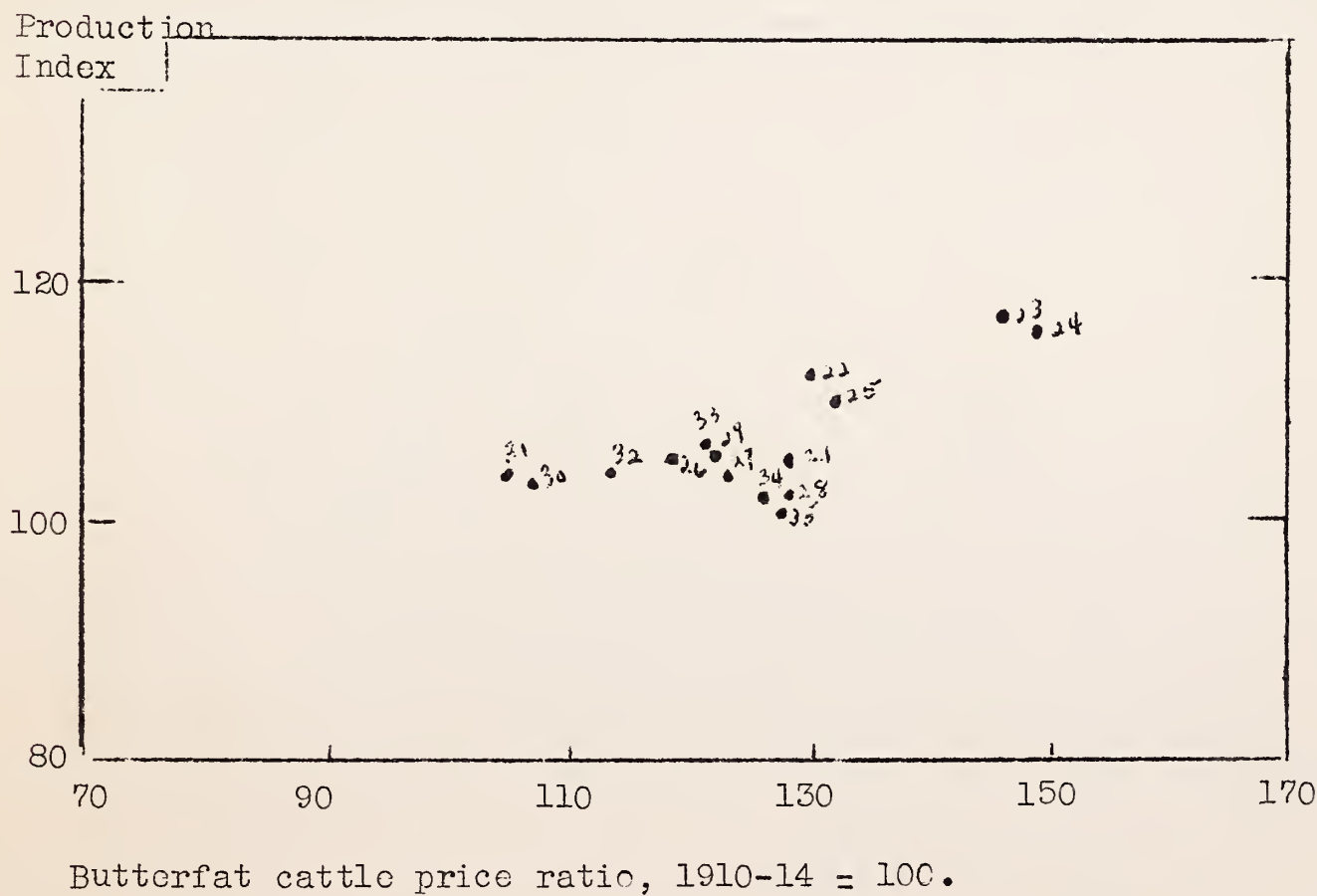


FIGURE 25. - RELATIONSHIP BETWEEN BUTTERFAT CATTLE PRICE RATIO (3-YEAR AVERAGE) AND DAIRY PRODUCTION 3 YEARS LATER, 1874-1914



CATTLE  
FIGURE 26. - RELATIONSHIP BETWEEN BUTTERFAT/PRICE RATIO (3-YEAR AVERAGE) AND DAIRY PRODUCTION 3 YEARS LATER, 1921-35



1891

1892

1893

1894

1895

1896

1897

1898

1899

1900

1901

1902

1903

1904

1905

1906

1907

1908

1909

1910

1911

1912

1913

1914

1915

1916

1917

1918

1919

1920

1921

1922

1923

1924

1925

1926

1927

1928

1929

1930

1931

1932

1933

1934

1935

1936

1937

1938

1939

1940

1941

1942

1943

1944

1945

1946

1947

1948

1949

FIGURE 27.- RELATIONSHIP BETWEEN BUTTERFAT HOG PRICE RATIO  
(2-YEAR WEIGHTED AVERAGE) AND BUTTERFAT CATTLE PRICE RATIO  
(3-YEAR AVERAGE) AND DAIRY PRODUCTION, 1874-1914

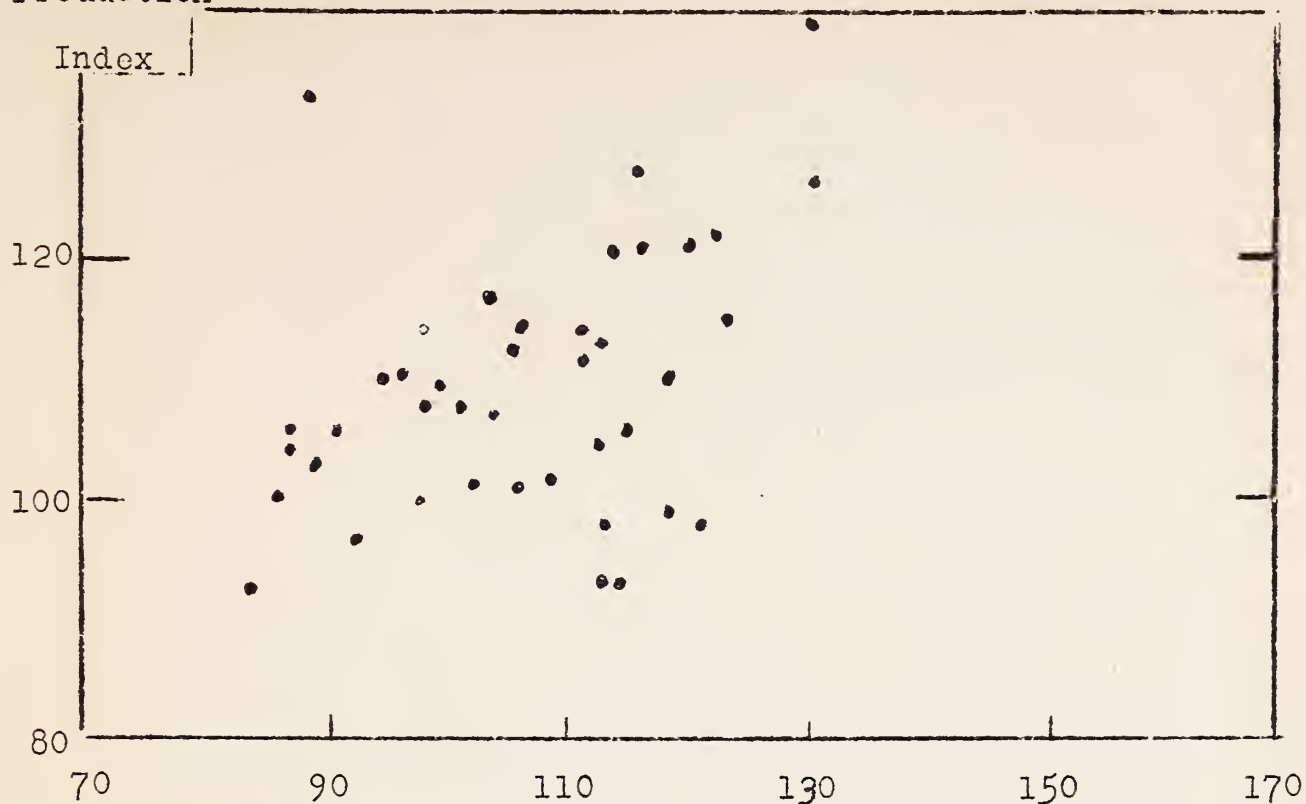
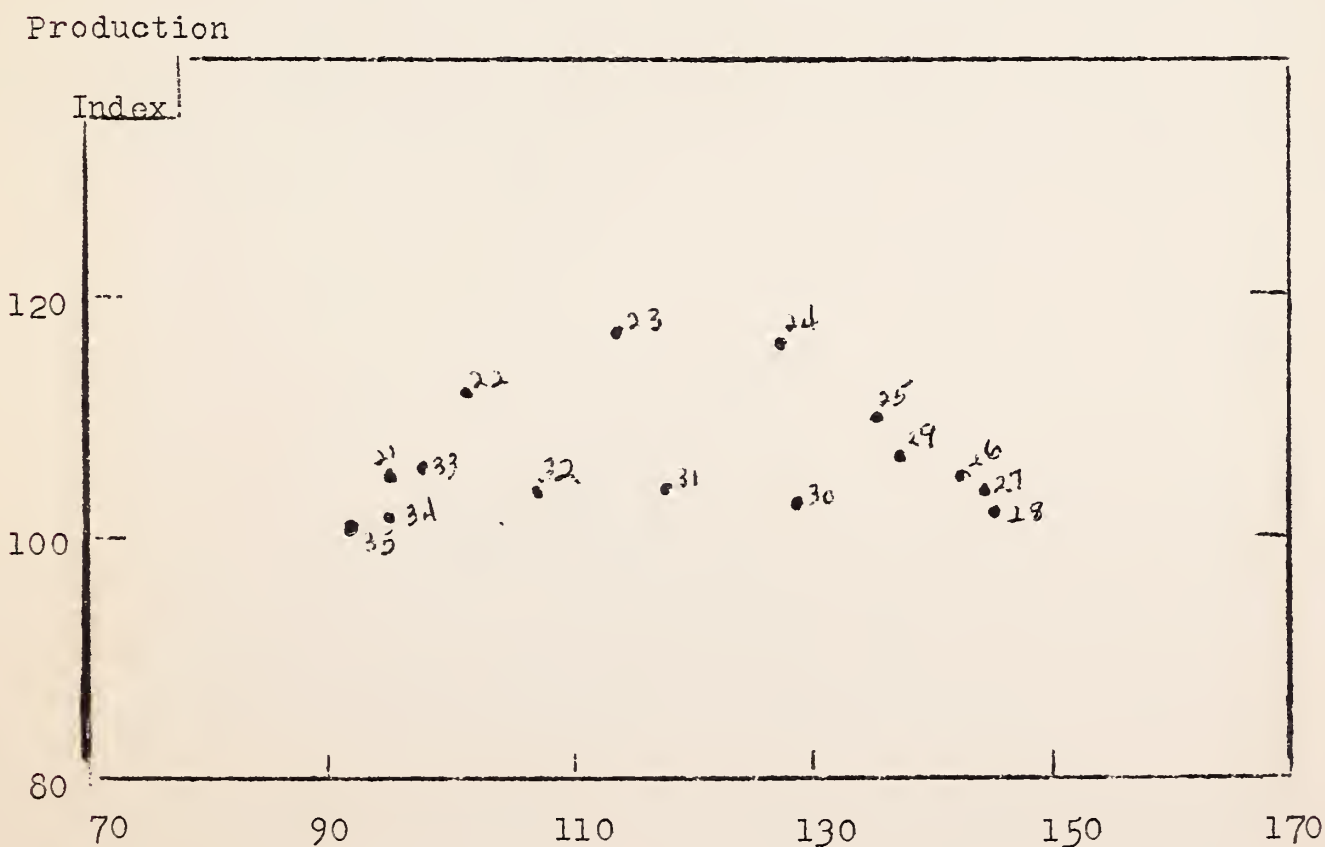


FIGURE 28.- RELATIONSHIP BETWEEN BUTTERFAT HOG PRICE RATIO  
(2-YEAR WEIGHTED AVERAGE) AND BUTTERFAT CATTLE PRICE RATIO  
(3-YEAR AVERAGE) AND DAIRY PRODUCTION, 1921-35



11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28



FIGURE 29.- RELATIONSHIP OF FEEDS FED (GRAIN AND HAY) BUTTERFAT-MEAT ANIMAL PRICE RATIO (HOGS 2-YEAR WEIGHTED AVERAGE AND CATTLE 3-YEAR AVERAGE LAGGED 3 YEARS) AND DAIRY PRODUCTION, 1874-1914

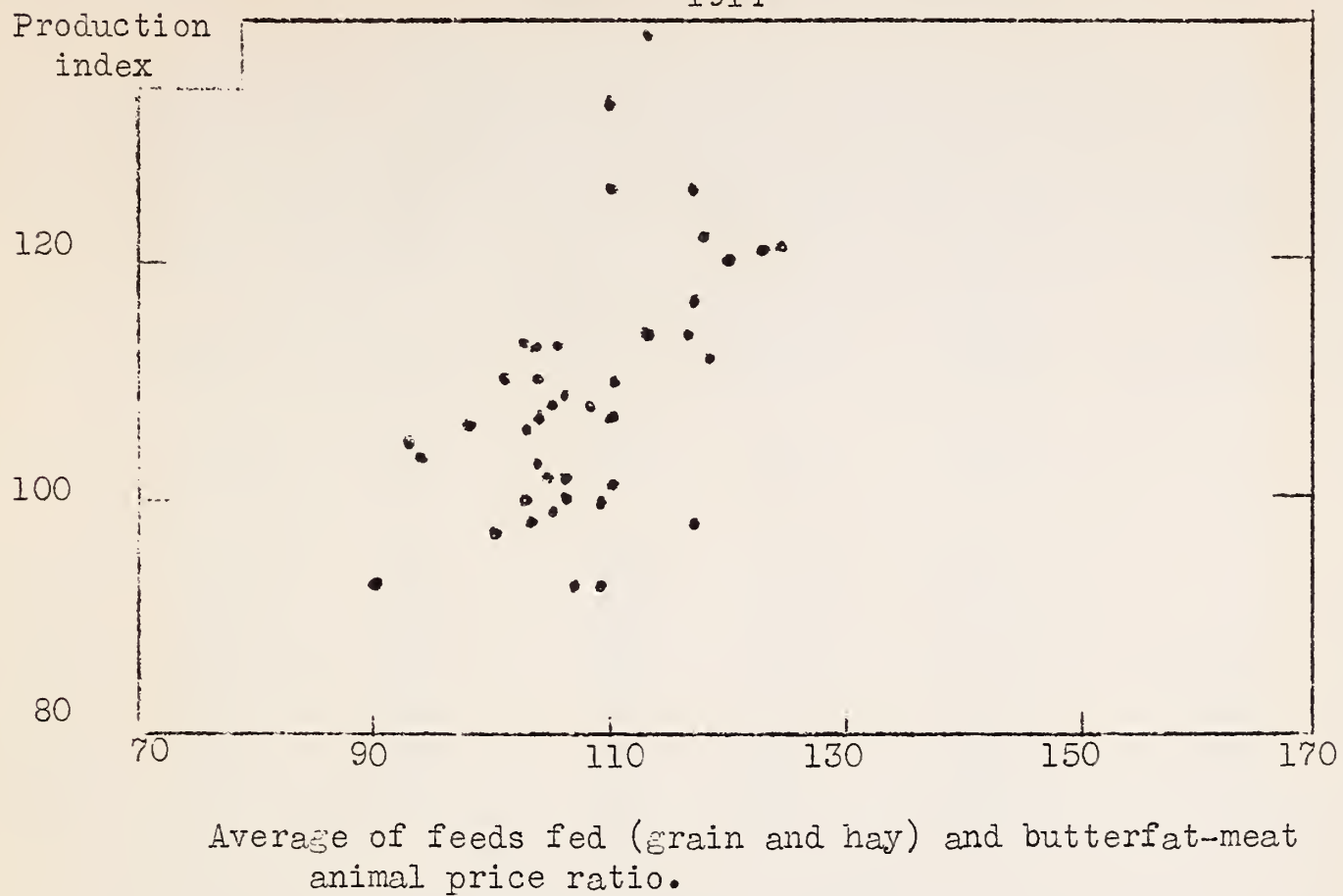


FIGURE 30.-RELATIONSHIP OF FEEDS FED (GRAIN AND HAY) BUTTERFAT-MEAT ANIMAL PRICE RATIO (HOGS 2-YEAR WEIGHTED AVERAGE AND CATTLE 3-YEAR AVERAGE LAGGED 3 YEARS) AND DAIRY PRODUCTION, 1921-35

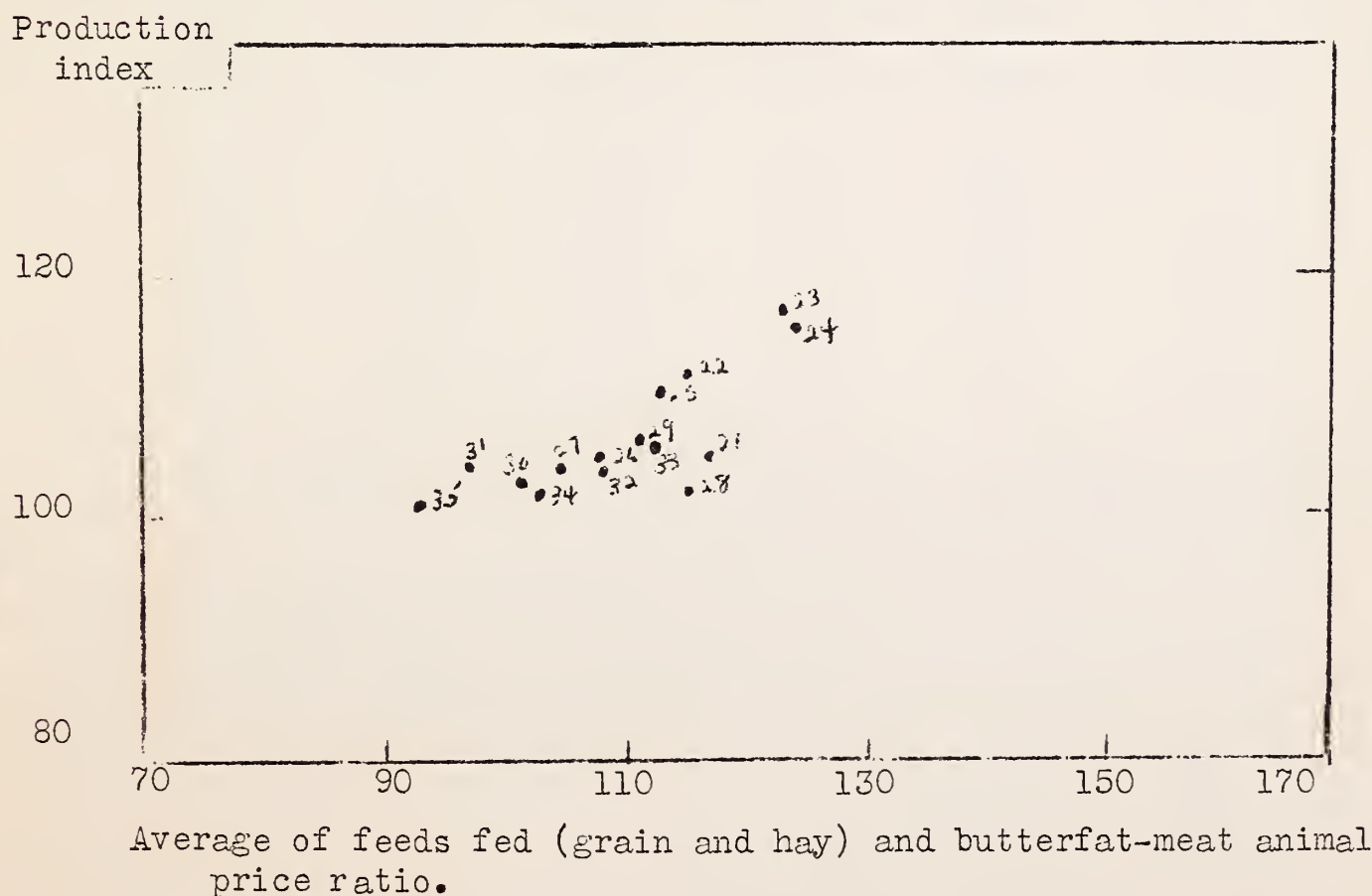




Table .- Production of manufactured dairy products (milk equivalent)  
compared with other agricultural products,  
selected periods, 1870-1934

Period	Production of manufactured dairy products <u>1/</u> (milk equivalent)						
	: Per	: Per ton of	: Per ton of	: Per bushel	: Per bale	: Per animal	: Per animal
	: Per	: feed grains:	: of	: of bread	: of cotton:	: unit on	: unit exclud-
	: capita	: produced	: hay	: grains pro-	: pro-	: farms	: ing milk
	:	: <u>2/</u>	: produced	: duced <u>3/</u>	: duced	: <u>4/</u>	: cows <u>5/</u>
	: Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1910-14	: 431	435	655	54.9	2,906	346	411
1926-30	: 462	561	757	61.2	3,782	407	487
1870-79	: 331	360	564	40.9	3,342		
1880-89	: 395	368	556	44.6	3,430		
1890-99	: 434	403	592	49.4	3,420	300	351
1900-09	: 444	409	612	53.6	3,362	327	383
1910-19	: 431	442	635	53.4	3,376	339	401
1920-29	: 453	519	694	59.5	4,121	373	445
1930-34	: 469	633	859	81.9	4,557	419	509
Index numbers (1926-30 = 100)							
	Production of manufactured dairy products (milk equivalent.)						
	: Per	: Per ton	: Per ton	: Per bushel	: Per bale	: Per	: Per animal
	: Per	: of	: of	: of bread	: of cotton:	: animal	: unit exclud-
	: capita	: feed grains:	: hay	: grains	: pro-	: unit	: ing milk
	:	: produced	: produced	: produced	: duced	:	: cows
1910-14	: 93.3	77.5	86.5	89.7	76.8	85.0	84.4
1926-30	: 100.0	100.0	100.0	100.0	100.0	100.0	100.0
1870-79	: 71.6	64.2	74.5	66.8	88.4		
1880-89	: 85.5	65.6	73.4	72.9	90.7		
1890-99	: 93.9	71.8	78.2	80.7	90.4	73.7	72.1
1900-09	: 96.1	72.9	80.8	87.6	88.9	80.3	78.6
1910-19	: 93.3	78.8	83.9	87.3	89.3	83.3	82.3
1920-29	: 98.1	92.5	91.7	97.2	109.0	91.6	91.4
1930-34	: 101.5	112.8	113.5	133.8	120.5	102.9	104.5

1/ Includes farm and factory butter, farm and factory cheese, condensed milk, evaporated milk, commercial ice cream, malted milk, dried whole milk, and dried cream.

2/ Includes corn, oats, and barley.

3/ Includes wheat and rye.

4/ Based on inventory numbers of cattle, hogs, sheep, horses, mules, and poultry on farms January 1 of each year.

5/ Same as in footnote 4 but excluding milk cows.

1. The first part of the paper is devoted to a general discussion of the problem of the existence of solutions of the system of equations

$$\frac{dx}{dt} = f(x, y, z), \quad \frac{dy}{dt} = g(x, y, z), \quad \frac{dz}{dt} = h(x, y, z),$$

where  $f, g, h$  are continuous functions of  $x, y, z$  and satisfy certain conditions. It is shown that under these conditions the system has a unique solution for any initial conditions.

2. In the second part of the paper the problem of the stability of the solutions of the system is considered.

It is shown that if the functions  $f, g, h$  satisfy certain conditions, then the solutions of the system are stable.

3. In the third part of the paper the problem of the periodicity of the solutions of the system is considered.

It is shown that if the functions  $f, g, h$  satisfy certain conditions, then the solutions of the system are periodic.

4. In the fourth part of the paper the problem of the bifurcation of the solutions of the system is considered.

It is shown that if the functions  $f, g, h$  satisfy certain conditions, then the solutions of the system bifurcate.

5. In the fifth part of the paper the problem of the asymptotic stability of the solutions of the system is considered.

It is shown that if the functions  $f, g, h$  satisfy certain conditions, then the solutions of the system are asymptotically stable.

6. In the sixth part of the paper the problem of the global stability of the solutions of the system is considered.

It is shown that if the functions  $f, g, h$  satisfy certain conditions, then the solutions of the system are globally stable.

7. In the seventh part of the paper the problem of the global periodicity of the solutions of the system is considered.

It is shown that if the functions  $f, g, h$  satisfy certain conditions, then the solutions of the system are globally periodic.

8. In the eighth part of the paper the problem of the global bifurcation of the solutions of the system is considered.

It is shown that if the functions  $f, g, h$  satisfy certain conditions, then the solutions of the system globally bifurcate.

9. In the ninth part of the paper the problem of the global asymptotic stability of the solutions of the system is considered.

It is shown that if the functions  $f, g, h$  satisfy certain conditions, then the solutions of the system are globally asymptotically stable.

10. In the tenth part of the paper the problem of the global global stability of the solutions of the system is considered.

It is shown that if the functions  $f, g, h$  satisfy certain conditions, then the solutions of the system are globally globally stable.